

**Wichita – Sedgwick County Regional Intelligent  
Transportation System (ITS) Architecture  
Version 1.0**

**VOLUME 2  
IMPLEMENTATION PLAN**

Submitted by



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# 1 Introduction

## 1.1 Background

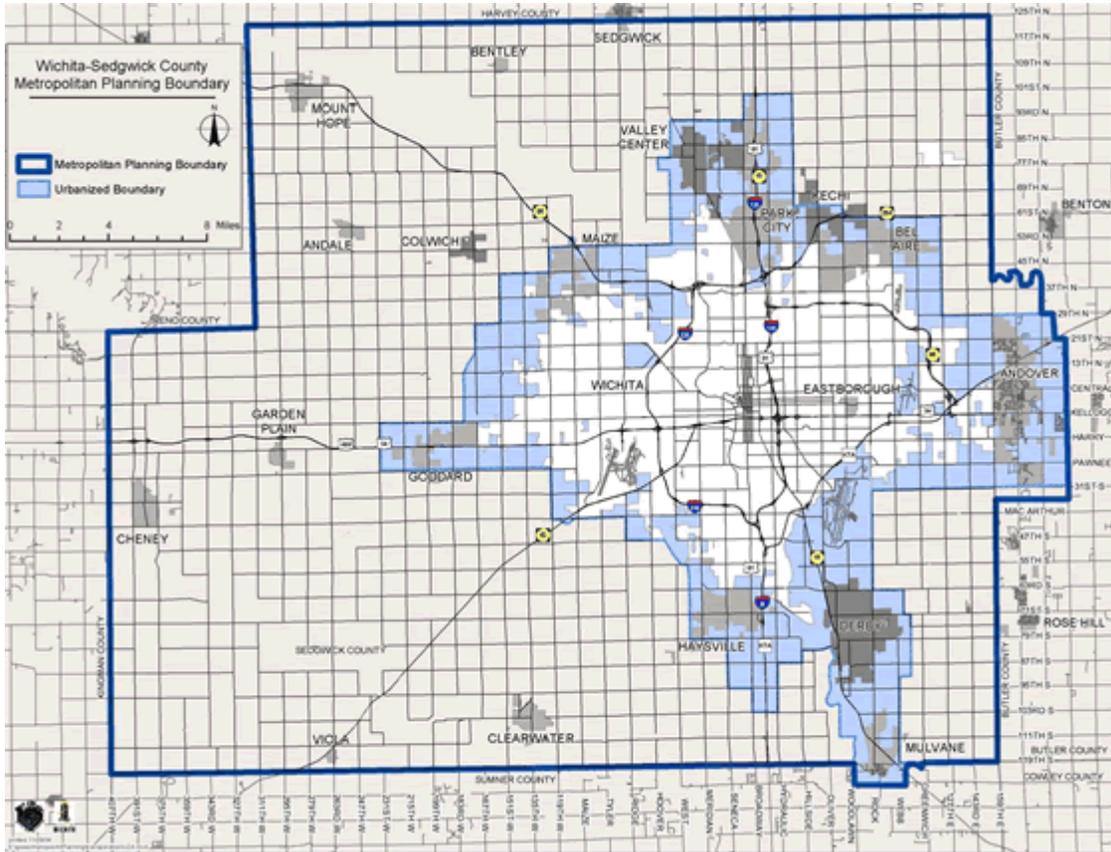
In 1998, the Wichita-Sedgwick County region published the Strategic Deployment Plan for Intelligent Transportation Systems (ITS). The purpose of the study was to identify the ITS user services appropriate for the Wichita region and to develop a strategic deployment plan to provide these user services. In 2001, the Wichita-Sedgwick County region participated in the creation of an initial Wichita-Sedgwick County Regional ITS Architecture based on the National ITS Architecture and the 1998 Strategic Deployment Plan. The current Wichita-Sedgwick County Regional ITS Architecture project will result in three volumes. This document is Volume 2 and contains the Implementation Plan based upon the Architecture (Volume 1). Volume 3 will leverage the information in Volumes 1 and 2 in the creation of a Communications Plan. There is a companion web site for the Wichita – Sedgwick County Regional ITS Architecture at [www.iteris.com/wichitaarchitecture](http://www.iteris.com/wichitaarchitecture).

An ITS Architecture provides a blueprint of how transportation systems within the region will be identified and interconnected. This Volume 2 Implementation Plan document based on the architecture defined in Volume 1 describes projects within the overall regional ITS architecture and their phasing or sequencing over the next 20 years. This document contains project definitions as well as project sequencing, a list of necessary agency agreements for interconnecting diverse stakeholders systems, ITS standards recommendations to help with standardizing electronic communication between stakeholders and an architecture maintenance plan which will detail the process for keeping the Wichita-Sedgwick County Regional ITS Architecture up to date.

This document is a direct result of stakeholder meetings held in Wichita where participants discussed in detail the existing and future information exchanges between surface transportation systems which were captured in the Wichita-Sedgwick County Regional ITS Architecture. During the development of the regional architecture, a number of projects were identified in the near, medium and long-term. The second section describes how projects were selected and relates the projects to the overall ITS and transportation planning process. Section 3 of this document describes each proposed project at a high-level. Section 4 contains general project sequencing for the region. Section 5 describes applicable ITS Standards. Section 6 contains a list of agency agreements and section 7 describes the Wichita – Sedgwick County Regional ITS Architecture Maintenance Plan.

## 1.2 Geographic Scope

The geographic scope for the Wichita–Sedgwick County Regional ITS Architecture is the MPO Planning area overseen by the MAPD which included the City of Wichita, Sedgwick County, City of Andover in Butler County, Town of Sedgwick and the City of Mulvane in Sumner County.



**Figure 1. Wichita-Sedgwick County Metropolitan Planning Boundary**

Although the scope of this regional ITS architecture is the MPO planning boundary (Figure 1), adjacent geographic areas to the planning boundary can also be included in the architecture.

### **1.3 Timeframe**

There are five categories of time frames that were decided by the region’s stakeholders. The first category is “Existing” which represents those transportation elements and services that currently exist in the region. The second category is “Short Term” which represents those projects and services that should be developed for the region in the next 0-5 years. The third category is “Medium Term” which represents those projects and services that should be developed for the region in the Year 6 to Year 10 timeframe. The fourth category is “Long Term” which represents those projects and services that should be developed for the region 10 years beyond the Year 10 timeframe. The final category is “Not Planned” which represents those projects and services that are not planned at this time and these aspects of the architecture do not appear in any of the following diagrams. Sometimes an element may have multiple timeframes (e.g., the KDOT Traffic Operations Center currently is planned near term but some of its capabilities like sending ramp metering control messages to its ramp meters is medium term) so usually the timeframe for the element is the closest to the present timeframe. The timeframes are based on the published date of this document

**Table 1. Timeframes of the Wichita – Sedgwick County Regional ITS Architecture**

Existing	Currently Exists	2005
Near-Term	5-Year Plan	2005-2009
Medium-Term	10-Year plan	2010-2014
Long-Term	20-Year Plan	2015-2019
Not Planned	Beyond 20 Year Plan	Beyond 2019

## **2 Projects**

This section describes the myriad of surface transportation services for the Wichita-Sedgwick County region. Some services (e.g., City of Wichita Network Surveillance) are specific to one primary stakeholder (e.g., the City of Wichita); while other services require multiple stakeholder participation in order to accomplish the given service. An example of a region-wide service is the Regional Traffic Control service where KDOT's freeway management is coordinated with the arterial roadway management by the City of Wichita. Each transportation service depicts multiple transportation inventory elements along with information flows representing information content exchanges between the elements that are necessary to accomplish different level of each service. These information flows have directionality as indicated by the arrow pointing to the destination element. Also, each information flow has been given a timeframe status (e.g., Existing, Near Term, Medium Term, Long Term or Not Planned) as defined in section 1.3 of this document.

### **2.1 Introduction**

The incorporation of the Wichita-Sedgwick County ITS Architecture in the planning process will ultimately yield projects that are linked to the Wichita-Sedgwick County ITS Architecture. Through the deployment of projects produced from the planning process, the services supported in the Wichita-Sedgwick County ITS Architecture will be implemented and be made a reality in the transportation system. Project implementation completes the evolution from transportation needs to services, to functional description in the Wichita-Sedgwick County ITS Architecture, to project identification in the planning process, and to project definition and deployment. The overarching goal of the Wichita-Sedgwick County ITS Architecture development process is that this evolution take place with the maximum amount of integration knowledge possible so as to efficiently and economically implement the systems required to serve the transportation community and users.

Key to this process or evolution is to understand what dependencies or relationships exist between systems and projects so that an order can be identified for deployment. Given the importance of integration for ITS, understanding the dependencies of one system on another or one project on another is critical to viewing the entire transportation system at a high, functional level. The Wichita-Sedgwick County ITS Architecture provides this view point and makes possible the understanding of the relationships between the ITS systems in the region.

Project sequencing defines the order in which ITS projects should be implemented. A good sequence is based on a combination of transportation planning factors that are used to prioritize projects (e.g., identify early winners) and the project dependencies that show how successive ITS projects can build on one another.

In most cases, the first projects in the project sequence will already be programmed and will simply be extracted from existing transportation plans. Successive projects will then be added to the sequence based on the project dependencies and other planning factors.

## **2.2 Process For Selecting Projects**

A three step process was used to select projects for the Wichita-Sedgwick County ITS Architecture:

- Review of the Wichita Metropolitan Area Strategic Deployment Plan dated December 1998,
- Review of the Mobile Data and Automatic Vehicle Location Needs Assessment and Alternatives Analysis Report dated June 2003, and
- Most importantly, stakeholder interaction and feedback.

The Wichita-Sedgwick County ITS Architecture was created based on the needs, as documented in the Strategic Deployment Plan, for the region over the next 20 years. The architecture identifies which systems operated by agencies in the Wichita-Sedgwick county area should be interfaced to maximize integration opportunities throughout the region. Based on the existing and future needs, the first step of the process identified ITS projects to support stakeholder needs and the information represented in the architecture.

ITS projects provide services that meet the needs of the stakeholders in the region. In the Wichita – Sedgwick County ITS Architecture, these services are represented by market packages. Market packages identify the systems and information exchanges between those subsystems that facilitate the delivery of a service. To identify ITS projects from the Wichita – Sedgwick County ITS Architecture, market packages were examined and selected that best met the short, medium, and long term needs of the region. The market packages provided scope for each ITS project identified. In addition, the market packages provided insight into the hierarchy and dependencies between the identified ITS projects.

Once the ITS projects were identified, the second step in the process was to review the wireless communications plan. The wireless communication plan described numerous opportunities for wireless communication with several agencies throughout the Wichita-Sedgwick County area.

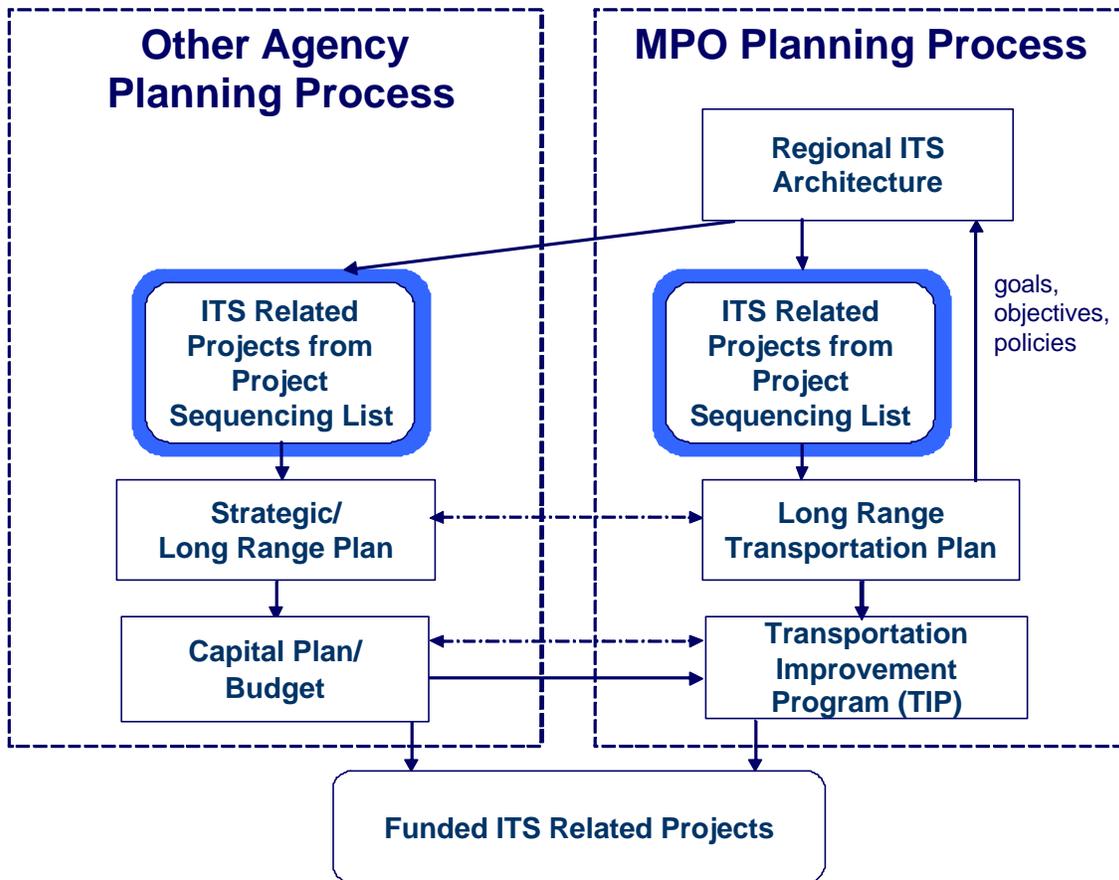
The third step in the process, was to obtain stakeholder feedback on the proposed ITS projects and their prioritization. Obtaining stakeholder feedback was necessary for the following reasons:

- Ensure an ITS Project was consistent with stakeholder needs.
- Confirm estimated timeline or priority for ITS Project deployment.
- Understand the relationship and traceability between ITS projects and the Wichita-Sedgwick County ITS Architecture.

### **2.3 How To Use The Projects**

The recommended ITS project sequencing provided in the next section of this document should be used as an input for the Long Range Transportation Plan of the MPO and the Strategic/Long Range Plan for other planning organizations. The planning process allocates ITS projects funding in coordination with other transportation projects.

The Transportation Planning Process produces ITS projects that must go through a project development or implementation process that applies a systems engineering approach to reduce risk and costly redesign efforts. Figure 2 illustrates the planning process, how the Wichita-Sedgwick County ITS Architecture is incorporated and where the Project Sequencing fits into the process. As illustrated in the figure, the ITS Related Projects that come out of the Wichita-Sedgwick County ITS Architecture are from the Project Sequencing List. These projects are inputs into the Long Range Transportation Plan as well as the Strategic/Long Range Plans of other agencies outside the MPO process.



**Figure 2. The Overall Planning Process with ITS Project Sequencing**

As displayed in the next section, sequenced projects are divided in near/medium/long-term timeframes. These sequenced projects should be represented in the Long Range Plans. As these sequenced projects go through the planning process, the ones identified as Near-Term would be transitioned in the TIP and Capital Plan/Budget.

The key question stakeholders may ask is, now that I have a comprehensive list of ITS projects separated by timeframe for my region, how do I use the projects to achieve the goals expressed in the Wichita – Sedgwick County ITS Architecture? To answer this question, stakeholders should focus on the following concepts.

**Why is this important?** Stakeholders should remember the reasons for going through the process of creating sequenced ITS Projects. Ultimately they want to deploy projects that support the needs expressed in their Wichita – Sedgwick County ITS Architecture.

**Who’s in Charge?** Stakeholders should consider identifying a person or group that is responsible for managing how ITS Projects get deployed. This person or group would be aware of the big picture by familiarizing themselves with all of the planned activities and ensure integration opportunities are maximized in project deployments.

**Systematic Process:** Stakeholders should ensure that projects are managed in a systematic manner. For example, in order for the traveler information system project to experience a successful deployment, the surveillance and traffic management would need to be deployed first to ensure appropriate field devices are installed and supported by algorithms to convey useful traveler information to motorists.

**Funding Allocation:** Stakeholders should ensure funding is allocated appropriately to support projects that have dependencies or synergies to be utilized. This is important if there are future projects that will depend on a short term or current project. The short term or current project must be funded appropriately to support the accommodation of known future project features or interfaces, thus avoiding redesign for future project accommodation.

**Project List Management:** Stakeholders should prioritize projects within their common timeframes based on the aforementioned concepts. It is important for Near-Term projects to be reviewed by stakeholders prior to being transitioned into the TIP. A person or group designated as a list manager should be responsible for removing projects from the list once implemented. Although project lists may reflect a single project, projects are typically broken into multiple phases and are implemented in an incremental manner. For example, many ITS projects are partially deployed as part of larger construction projects. A project's scope might involve interfacing with ten agencies and funding constraints may require agencies to be interconnected one at a time. In this situation, a project might be implemented in five years, if two agencies are being interconnected per year. If a project is partially implemented due to unforeseen circumstances (e.g., limited funding received), then the list manager should update the project to reflect the remaining components that need to be implemented. The key point for project list management is projects will be implemented in an incremental manner, therefore the list manager should keep accurate records of the incremental process and meet with stakeholders to determine how funding should be re-allocated.

**Desired Outcome:** Stakeholders should remember the desired outcome which is to deploy projects to maximize integration opportunities throughout the Wichita-Sedgwick County region. Therefore, when projects are transitioned into the project development phase, stakeholders should always be aware of other project deployment activities (even if the other activities require a project to be deployed at a different time). This mindset will require stakeholders to be flexible in developing interfaces that will allow for future expansion based on overall regional needs.

An important issue to remember is when a project is to be implemented; stakeholders should convene to determine the specific details for deploying a project (e.g., how many phases will be required for this project and which components of market packages are

allocated to a particular phase?). The next section should be used as a guide to which agencies/systems and interfaces should be considered during the discussion and design phase for project implementation.

Using the sequenced projects as described in Figure 2 and following the aforementioned concepts will aid stakeholders in understanding ITS projects planned for deployment and support integration efforts throughout the Wichita-Sedgwick County region.

### 3 Project Definition

This section contains the projects identified by the stakeholders of the Wichita-Sedgwick County region. It summarizes the potential deployment ITS projects in this region. The following information is provided for each project:

- Project Category
- Project Number
- Project Title
- Time Frame
- Duration
- Project Costs
- Stakeholders
- Project Dependencies
- Expected Benefits
- Market Packages to Consider

The project numbers are used for reference purposes only and do not indicate any type of priority. Some project numbers have letters appended to them representing different phases of the same overall project.

The cost estimates included with each project are based on past ITS project experience and costs found through various ITS studies that have been performed. The costs are divided into overall capital costs as well as annual operations and maintenance (O&M) costs. In most cases, the annual O&M costs are 10% of the capital costs to date. Some project phases do not have O&M costs since they are studies or design before implementation. It is important to keep in mind that all the costs are rough orders of magnitude and are based on numerous assumptions for planning purposes only. It is highly recommended that detailed cost estimates be made for each project before project initiation.

Within this section, the projects are described under one of the following four applicable categories:

- Travel and Traffic Management
- Maintenance & Construction Management
- Public Transportation Management
- Emergency Management

There were other areas identified by the contents of the Regional ITS Architecture that are crosscutting (e.g., archived data) the stakeholders decided to fold into the projects in the above categories. Some areas of the regional ITS architecture did not result in explicit projects at this time due to stakeholder priority as foundational systems need to be developed first before capabilities like Disaster Response and Evacuation can be implemented. Other areas of the Wichita-Sedgwick County Regional ITS Architecture

are more appropriately deployed at the State level (e.g., KHP, KTA, and CVO). It is expected that Kansas will develop a Statewide ITS Architecture in the near future.

A summary of the proposed deployment projects is presented in Table 2 followed by detailed descriptions of each project in section 3.1.

Table 2. Proposed Deployment Projects

#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
<b>Travel &amp; Traffic Management</b>							
1	City of Wichita Traffic Operation Center	Near-Term	2M	200K	City of Wichita	In conjunction with the City of Wichita and Sedgwick County ITS Signal System Upgrade projects.	<ul style="list-style-type: none"> <li>• More responsive incident management</li> <li>• More effective traffic management</li> </ul>
2A	City of Wichita ITS Signal System Upgrade Study Project	Near-Term	500K	None.	City of Wichita Sedgwick County KDOT	None	<ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul>
2B	City of Wichita ITS Signal System Upgrade Project Design	Near-Term	1M	None.	City of Wichita Sedgwick County KDOT	In conjunction with Wichita TOC upgrade and after the City of Wichita ITS Signal System Upgrade Study Project	<ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul>
2C	City of Wichita ITS Signal System Upgrade Project Implementation	Near-Term to Medium-Term	9M	900K	City of Wichita Sedgwick County KDOT	In conjunction with Wichita TOC upgrade and after the City of Wichita ITS Signal System Upgrade Project Design	<ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
2D	City of Wichita ITS Signal System Project for Sedgwick County	Medium-Term	500K	50K	City of Wichita Sedgwick County KDOT	Requires communications connection to Sedgwick County, Wichita TOC upgrade, planned for after City has upgraded its signals	<ul style="list-style-type: none"> <li>Improved Transportation efficiency and air quality</li> <li>Efficient signal timing plan</li> <li>More effective traffic and incident management</li> <li>Reduced Delay</li> </ul>
3	Regional Traffic and Incident Management	Near-Term to Medium-Term	1M	100K	Kansas Highway Patrol Kansas Turnpike Authority KDOT KHP-Turnpike Media Sedgwick County Wichita IT/IS City of Wichita Wichita Transit	City of Wichita Traffic Operation Center, City of Wichita ITS Signal System Upgrade Project Implementation, DOT Ramp Metering Project, DOT Traffic Operations Center(TOC) Wichita Metro	<ul style="list-style-type: none"> <li>More effective traffic management</li> <li>Improved resources for analysis ,planning and design</li> <li>More effective special event management</li> <li>Improved resources for analysis, planning and design</li> <li>More effective special event management</li> <li>More effective traffic management, incident management &amp; maintenance management</li> </ul>
4A	KDOT Ramp Metering Project	Near-Term	120K	6K	KDOT	None	<ul style="list-style-type: none"> <li>Improved traffic flow along US-54</li> </ul>
4B	KDOT Traffic Operations Center (TOC) Wichita Metro – Design	Near-Term	800K		KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita	None	<ul style="list-style-type: none"> <li>Surveillance and monitoring capabilities</li> <li>More responsive incident management</li> <li>Improve safety and efficiency</li> <li>More effective traffic management</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
							<ul style="list-style-type: none"> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental conditions</li> </ul>
4C	KDOT Traffic Operations Center (TOC) Wichita Metro – Near –Term	Near-Term	9.7M	970K	KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita	KDOT Traffic Operations Center (TOC) Wichita Metro – Design	<ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> <li>• Improve safety and efficiency</li> <li>• More effective traffic management</li> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental conditions</li> </ul>
4D	KDOT Traffic Operations Center (TOC) Wichita Metro – Medium – Term	Medium-Term	6M	1M	KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita	KDOT Traffic Operations Center (TOC) Wichita Metro – Near -Term	<ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> <li>• Improve safety and efficiency</li> <li>• More effective traffic management</li> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
							<ul style="list-style-type: none"> <li>management</li> <li>More effective monitoring environmental conditions</li> </ul>
4E	KDOT Traffic Operations Center (TOC) Wichita Metro – Long – Term	Long-Term	6.2M	1.2M	KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita	KDOT Traffic Operations Center (TOC) Wichita Metro – Medium – Term	<ul style="list-style-type: none"> <li>Surveillance and monitoring capabilities</li> <li>More responsive incident management</li> <li>Improve safety and efficiency</li> <li>More effective traffic management</li> <li>Real-time traveler information</li> <li>More efficient winter maintenance management</li> <li>More effective monitoring environmental conditions</li> </ul>
5A	Wichita Area WiMax Communications Site Survey and Design Project	Near-Term	300K		KDOT City of Wichita Sedgwick County Public Safety Agencies Wichita Transit	None	<ul style="list-style-type: none"> <li>Wide area wireless communications limit dependence on leased lines</li> <li>Flexible communications options</li> <li>Secondary communications for public safety</li> </ul>
5B	Wichita Area WiMax Public Safety Vehicle Communications Project	Near-Term	2.7M	300K	KDOT City of Wichita Sedgwick County Public Safety Agencies	Wichita Area WiMax Communications Site Survey and Design Project	<ul style="list-style-type: none"> <li>Wide area wireless communications limit dependence on leased lines</li> <li>Flexible communications options</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
							<ul style="list-style-type: none"> <li>Secondary communications for public safety</li> </ul>
5C	Wichita Area WiMax Transit Vehicle Communications Project	Near-Term	200K	50K	KDOT City of Wichita Sedgwick County Wichita Transit	Wichita Area WiMax Public Safety Vehicle Communications Project	<ul style="list-style-type: none"> <li>Wide area wireless communications limit dependence on leased lines</li> <li>Flexible communications options</li> <li>Transit vehicle fleet communications enables transit applications</li> </ul>
6	Air Quality Alert System	Long-Term	100K	10K	City of Wichita Dept. of Env. Health Media	None	<ul style="list-style-type: none"> <li>Air quality monitoring</li> <li>More effective environment management</li> </ul>
7	Railroad Grade Crossing System	Long-Term	750K	75K	Sedgwick County City of Wichita Railroads	City of Wichita ITS Signal System Upgrade Project Implementation	<ul style="list-style-type: none"> <li>Improved safety</li> <li>More effective traffic management</li> </ul>
<b>Maintenance &amp; Construction Management</b>							
8	Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System	Long-Term	320K	32K	Sedgwick County	None	<ul style="list-style-type: none"> <li>More efficient use of maintenance fleet</li> </ul>
9	KDOT Maintenance and Construction Vehicle and Equipment Tracking System	Medium-Term	320K	32K	KDOT	None	<ul style="list-style-type: none"> <li>More efficient use of maintenance fleet</li> </ul>
10	City Of Wichita Maintenance and Construction Vehicle and Equipment Tracking System	Medium-Term	700K	70K	City of Wichita	None	<ul style="list-style-type: none"> <li>More efficient use of maintenance fleet</li> </ul>
11	KDOT Seasonal Maintenance System	Medium-Term	600K	60K	KDOT NOAA	KDOT Maintenance and Construction Vehicle and	<ul style="list-style-type: none"> <li>More efficient winter maintenance management</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
						Equipment Tracking System, in addition, this project is dependent on the Kansas Statewide 800MHz Communications System	<ul style="list-style-type: none"> <li>• More effective monitoring environmental condition</li> </ul>
12	Sedgwick County Seasonal Maintenance System	Long-Term	200K	20K	NOAA Sedgwick County	Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System	<ul style="list-style-type: none"> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul>
13	City of Wichita Seasonal Maintenance System	Long-Term	500K	50K	NOAA City of Wichita	City Of Wichita Maintenance and Construction Vehicle and Equipment Tracking System	<ul style="list-style-type: none"> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul>
<b>Public Transportation Management</b>							
14	Sedgwick County Department on Aging Transit Vehicle Tracking System	Long-Term	100K	10K	Sedgwick County City of Wichita	None	<ul style="list-style-type: none"> <li>• Provides transit vehicle tracking capability</li> <li>• Provides real time transit schedule</li> </ul>
15	City of Wichita Transit Vehicle Tracking System	Near-Term	1M	100K	City of Wichita Sedgwick County	None	<ul style="list-style-type: none"> <li>• Provides transit vehicle tracking capability</li> <li>• Provides real time transit schedule</li> </ul>
16	Sedgwick County Department on Aging Demand Response Transit System	Medium-Term	50K	5K	Sedgwick County	Sedgwick County Department on Aging Transit Vehicle Tracking System	<ul style="list-style-type: none"> <li>• More effective transit management</li> </ul>
17	City of Wichita Transit Fixed-Route Demand Response Transit System	Near-Term	100K	10K	City of Wichita	City of Wichita Transit Vehicle Tracking System	<ul style="list-style-type: none"> <li>• More effective transit management</li> </ul>
18	City of Wichita Personalized Para-	Near-Term	100K	10K	City of Wichita	None	<ul style="list-style-type: none"> <li>• Provides personalized</li> </ul>

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#	Title	Time Frame	Cost		Stakeholders	Dependencies	Benefits
			Capital Cost	O & M Cost (Annual)			
	Transit Services						<ul style="list-style-type: none"> <li>transit service</li> <li>More effective transit management</li> </ul>
19	Wichita Transit Passenger and Fare Management System	Near-Term	200K	20K	City of Wichita Wichita Transit	None	<ul style="list-style-type: none"> <li>More effective Transit Passenger and fare management</li> <li>Provides transit traveler card</li> </ul>
20	Wichita Transit Security System	Near-Term	400K	40K	City of Wichita Wichita Transit	None	<ul style="list-style-type: none"> <li>More secure transit operation</li> <li>Provide surveillance and sensor information</li> </ul>
21	Transit Traveler Information System	Medium-Term	200K	20K	KDOT Media City of Wichita	None	<ul style="list-style-type: none"> <li>Provides transit information</li> </ul>
<b>Emergency Management</b>							
22	Public Safety AVL Project	Near-Term	2.5M	250K	KDOT Sedgwick County City of Wichita Public Safety Agencies	None	<ul style="list-style-type: none"> <li>More responsive emergency management</li> </ul>
23	Suburban Communities AVL Project	Near-Term	225K	20K	Suburban Communities Public Safety Agencies	None	<ul style="list-style-type: none"> <li>More responsive emergency management</li> </ul>
24	Sedgwick County 911 Emergency Routing Project	Medium-Term	500K	50K	Kansas Highway Patrol Kansas Turnpike Authority KDOT Sedgwick County City of Wichita	Public Safety AVL Project	<ul style="list-style-type: none"> <li>More responsive emergency management</li> <li>Improved public safety</li> </ul>
25	Wichita Mid-Continent Airport Emergency Routing Project	Medium-Term	100K	10K	Wichita Airport Authority	None	<ul style="list-style-type: none"> <li>More responsive emergency management</li> <li>Improved public safety</li> </ul>

### 3.1 Project Descriptions

**Project # 1**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> City of Wichita Traffic Operation Center</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration :</b> 3 years</p> <p><b>Project Cost:</b> <b>Capital :</b> 2M <b>O &amp; M :</b> 200K</p> <p><b>Stakeholders:</b> City of Wichita</p> <p><b>Project Dependencies:</b> In conjunction with the City of Wichita and Sedgwick County ITS Signal System Upgrade projects.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More responsive incident management</li> <li>• More effective traffic management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> </ul>	<p><b>Scope of Project:</b></p> <p>This project will further develop a traffic operation center (TOC) in the City of Wichita. The TOC will allow City personnel to manage arterial congestion, respond to incidents on arterials and support public safety operations.</p> <p>This project will design and deploy a TOC based on functions desired by the Wichita-Sedgwick County region. The magnitude of TOC development will depend of the desired functionality. The following functions are key to the City of Wichita TOC:</p> <ul style="list-style-type: none"> <li>• Traffic monitoring;</li> <li>• Control of ITS devices;</li> <li>• Maintenance, repair, and troubleshooting;</li> <li>• Disseminate information;</li> <li>• Personnel management;</li> <li>• Data analysis;</li> <li>• Interface with media and public;</li> <li>• Plan, recommend, implement system and procedural upgrades;</li> <li>• Coordination with incident response agencies; and</li> <li>• Coordination with other local and regional transportation agencies.</li> </ul> <p>Currently, the City is conducting a study on upgrading its Signal Systems. The results of this study will determine the scope and cost of the City TOC in conjunction with the ITS Signal System Upgrade project.</p> <p>The Traffic Information Dissemination service provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information.</p> <p>This service also covers the equipment and interfaces that provide traffic information from the City of Wichita's Traffic Operations Center to the media (for instance via a direct tie-in between these traffic management centers and radio or television station computer systems), Wichita Transit Operations Center, Wichita Transit Customer Information System, Sedgwick County 911, other Public Safety agencies, and KDOT TOC. A</p>
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<ul style="list-style-type: none"><li>• Surface Street Control</li><li>• Traffic Information Dissemination</li><li>• Traffic Incident Management System</li><li>• ITS Data Mart</li></ul>	<p>link to the KDOT and Wichita-Sedgwick County Maintenance and Construction agencies allows dissemination of real time information on road closures due to maintenance and construction activities.</p>
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**Project # 2A**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> City of Wichita ITS Signal System Upgrade Study Project</p> <p><b>Time Frame:</b> Near Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 500K</p> <p><b>Stakeholders:</b> City of Wichita Sedgwick County KDOT</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Surface Street Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> </ul>	<p><b>Scope of Project:</b></p> <p>This project will improve transportation efficiency and air quality through developing a City of Wichita ITS Signal System Upgrade, which will manage traffic using vehicle detectors on key arterial routes to measure traffic levels. This project will study alternatives for implementing coordinated signal systems for the City of Wichita. The combination of vehicle detectors and new signal timing plans will help smooth City traffic flow. Special signal timing plans will also be developed to address traffic congestion caused by special events venues.</p> <p>The City of Wichita Network Surveillance service will also be evaluated as part of this study including traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The City of Wichita Surface Street Control service will also be evaluated during this study potentially providing the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for the City of Wichita. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.</p>
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**Project # 2B**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> City of Wichita ITS Signal System Upgrade Project Design</p> <p><b>Time Frame:</b> Near Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 1M</p> <p><b>Stakeholders:</b> City of Wichita Sedgwick County KDOT</p> <p><b>Project Dependencies:</b> In conjunction with Wichita TOC upgrade and after the City of Wichita ITS Signal System Upgrade Study Project</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Surface Street Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> </ul>	<p><b>Scope of Project:</b></p> <p>This project will improve transportation efficiency and air quality through developing a City of Wichita ITS Signal System Upgrade, which will manage traffic using vehicle detectors on key arterial routes to measure traffic levels. This phase of the project is the design that will also enable the development of efficient signal timing plans on key routes to support a traffic responsive signal system. The combination of vehicle detectors and new signal timing plans will help smooth traffic flow. Special signal timing plans will also be developed to address traffic congestion caused by special events venues. Currently, the City of Wichita is conducting a city-wide signal system study.</p> <p>The City of Wichita Network Surveillance service will also be a part of this design project and includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The City of Wichita Surface Street Control service provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for the City of Wichita. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.</p>
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**Project # 2C**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> City of Wichita ITS Signal System Upgrade Project Implementation</p> <p><b>Time Frame:</b> Near-Term to Long-Term</p> <p><b>Duration:</b> 8 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 9M <b>O &amp; M:</b>900K</p> <p><b>Stakeholders:</b> City of Wichita Sedgwick County KDOT</p> <p><b>Project Dependencies:</b> In conjunction with Wichita TOC upgrade and after the City of Wichita ITS Signal System Upgrade Project Design</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Surface Street Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> </ul>	<p><b>Scope of Project:</b></p> <p>This project will improve transportation efficiency and air quality through developing a City of Wichita ITS Signal System Upgrade, which will manage traffic using vehicle detectors on key arterial routes to measure traffic levels. This project will also develop efficient signal timing plans on these key routes to support a traffic responsive signal system. The combination of vehicle detectors and new signal timing plans will help smooth traffic flow. Special signal timing plans will also be developed to address traffic congestion caused by special events venues. Currently, the City of Wichita is conducting a city-wide signal system study.</p> <p>The City of Wichita Network Surveillance service includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The City of Wichita Surface Street Control service provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for the City of Wichita. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.</p>
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**Project # 2D**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> City of Wichita ITS Signal System Upgrade Project for Sedgwick County</p> <p><b>Time Frame:</b> Medium Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 500K <b>O &amp; M:</b>50K</p> <p><b>Stakeholders:</b> City of Wichita Sedgwick County KDOT</p> <p><b>Project Dependencies:</b> Requires communications connection to Sedgwick County, Wichita TOC upgrade, planned for after City has upgraded its signals</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved Transportation efficiency and air quality</li> <li>• Efficient signal timing plan</li> <li>• More effective traffic and incident management</li> <li>• Reduced Delay</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Surface Street Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management</li> <li>• Maintenance and Construction Activity Coordination System</li> </ul>	<p><b>Scope of Project:</b></p> <p>This project will improve transportation efficiency and air quality through an extension of the City of Wichita ITS Signal System Upgrade, to the Sedgwick County signals. This project will also continue the development of efficient signal timing plans routes that include County arterials to support a traffic responsive signal system. The combination of vehicle detectors and new signal timing plans will help smooth traffic flow. Special signal timing plans will also be developed to address traffic congestion caused by special events venues. Currently, the City of Wichita is conducting a city-wide signal system study.</p> <p>The Sedgwick County Network Surveillance service includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data from Sedgwick County field devices back to the Wichita Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Wichita Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The Sedgwick County Surface Street Control service provides the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management for Sedgwick County, however, the City of Wichita will ultimately control the traffic signals through their planned traffic operations center. A range of traffic signal control systems are represented by this service ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests.</p>
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**Project # 3**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Regional Traffic and Incident Management</p> <p><b>Time Frame:</b> Near-Term to Medium-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 1M <b>O &amp; M:</b> 100K</p> <p><b>Stakeholders:</b> Kansas Highway Patrol Kansas Turnpike Authority KDOT KHP-Turnpike Media Sedgwick County Wichita IT/IS City Of Wichita Wichita Transit</p> <p><b>Project Dependencies:</b> City of Wichita Traffic Operation Center, City of Wichita ITS Signal System Upgrade Project Implementation, KDOT Ramp Metering Project, KDOT Traffic Operations Center (TOC) Wichita Metro</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More effective traffic management</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Regional Traffic Control service provides for the sharing of traffic information and control among the KDOT and City of Wichita Traffic Operations Centers to support a regional control strategy. This service advances the Surface Street Control and Freeway Control Services by adding the communications links and integrated control strategies that enable integrated inter-jurisdictional traffic control. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This service relies principally on roadside instrumentation supported by the Surface Street Control and Freeway Control Services and adds hardware, software, and fixed-point to fixed-point communications capabilities to implement traffic management strategies that are coordinated between the KDOT and Wichita Traffic Operations Centers.</p> <p>The Traffic Incident Management System service manages both unexpected incidents and planned events so that the impact to the Wichita regional area and traveler safety is minimized. This service includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination between the KDOT and Wichita Traffic Operations Centers, Wichita-Sedgwick County Maintenance and Construction agencies, Sedgwick County 911, and other Public Safety agencies as well as Rail Operations, Office of Central Inspection and Wichita Parks and Recreation System.</p> <p>Information from these diverse sources is collected and correlated by this service to detect and verify incidents and implement an appropriate response. This service supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between other systems in the Wichita regional area. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information services.</p> <p>The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with Sedgwick County 911, and other Public Safety agencies might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.</p>
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<ul style="list-style-type: none"><li>• Improved resources for analysis, planning and design</li><li>• More effective special event management</li><li>• More effective traffic management, incident management &amp; maintenance management</li></ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"><li>• Traffic Information Dissemination</li><li>• Regional Traffic Control</li><li>• Traffic Incident Management System</li></ul>	
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**Project # 4A**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> KDOT Ramp Metering Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 120K <b>O &amp; M:</b> 6K</p> <p><b>Stakeholders:</b> KDOT</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved traffic flow along US-54</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Freeway Control</li> </ul>	<p><b>Scope of Project:</b></p> <p>The KDOT Ramp Metering Project will provide roadside equipment to support ramp control for the freeway system operated by KDOT. This project is envisioned to deploy four ramp meters on three interchanges along US-54 at the Washington, Meridian and Seneca interchanges. Initially, the ramp meters will be autonomous. Once the KDOT TOC for the Wichita Metropolitan region is deployed, there are plans for an integration effort as part of the KDOT Wichita Metro Area TOC to allow for the TOC to remotely control the ramp meters.</p>
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**Project # 4B**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Design</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 800K <b>O &amp; M:</b></p> <p><b>Stakeholders:</b> KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> <li>• Improve safety and efficiency</li> <li>• More effective traffic management</li> </ul>	<p><b>Scope of Project:</b> Design of the KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of services it will provide including freeway control, network surveillance, traffic information dissemination, and work zone management. These are the services that KDOT expects to deploy in the near-term.</p>
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<ul style="list-style-type: none"><li>• Real-time traveler information</li><li>• More efficient winter maintenance management</li><li>• More effective monitoring environmental condition</li></ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"><li>• Network Surveillance</li><li>• Freeway Control</li><li>• Traffic Information Dissemination</li><li>• Traffic Incident Management System</li><li>• Roadway Closure Management</li><li>• Road Weather Data Collection</li><li>• Roadway Automated Treatment</li><li>• Work Zone Management</li><li>• Maintenance and Construction Activity Coordination</li><li>• Broadcast Traveler Information</li><li>• Interactive Traveler Information</li><li>• ITS Data Mart</li><li>• ITS Data Warehouse</li></ul>	
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**Project # 4C**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Near-Term</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 9.7M <b>O &amp; M:</b> 970K</p> <p><b>Stakeholders:</b> KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Design, KDOT Ramp Metering Project</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> <li>• Improve safety and efficiency</li> <li>• More effective</li> </ul>	<p><b>Scope of Project:</b> The KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of services it will provide including freeway control, network surveillance, traffic information dissemination, and work zone management. These are the services that KDOT expects to deploy in the near-term.</p> <p>The KDOT Freeway Control service provides the communications and roadside equipment to support ramp control, lane controls, and interchange control for the freeway system operated by KDOT. Coordination and integration of ramp meters are included as part of this service. This service uses the information from the City of Wichita and Sedgwick County Network Surveillance Service to support freeway monitoring and future adaptive strategies to manage traffic congestion.</p> <p>This service also includes the capability to utilize surveillance information for detection of incidents. Typically, the processing would be performed at the KDOT Traffic Operations Center.</p> <p>The KDOT Network Surveillance service includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the KDOT Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the KDOT Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The Traffic Information Dissemination service provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information.</p> <p>This service covers the equipment and interfaces that provide traffic information from the KDOT Traffic Operations Center to the media (for instance via a direct tie-in between these traffic management centers and radio or television station computer systems), Wichita</p>
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<p>traffic management</p> <ul style="list-style-type: none"> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Freeway Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> <li>• Roadway Closure Management</li> <li>• Road Weather Data Collection</li> <li>• Roadway Automated Treatment</li> <li>• Work Zone Management</li> <li>• Maintenance and Construction Activity Coordination</li> <li>• Broadcast Traveler Information</li> <li>• Interactive Traveler Information</li> <li>• ITS Data Mart</li> <li>• ITS Data Warehouse</li> </ul>	<p>Transit Operations Center, Wichita Transit Customer Information System, Sedgwick County 911, and other Public Safety agencies via the KDOT TOC Information System. A link to the KDOT and Wichita-Sedgwick County Maintenance and Construction agencies allows dissemination of real time information on road closures due to maintenance and construction activities.</p> <p>In addition, it is envisioned that there will be a regional 5-1-1 traveler information telephone service for the Wichita area. The KDOT TOC for the Wichita region is expected to provide this 5-1-1 capability including local transit and roadway information. How the Wichita regional 5-1-1 system will integrate with the Kansas state-wide 5-1-1 system is being developed at this time.</p> <p>The KDOT Work Zone Management service directs activity in KDOT's work zones, controlling traffic through portable dynamic message signs (DMS) and informing other groups of activity (e.g., KDOT TOC Information System, Wichita Traffic Operations Center, other Wichita-Sedgwick and Suburban maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones</p>
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**Project # 4D**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Medium-Term</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 5 years</p> <p><b>Project Cost:</b> <b>Capital:</b>6M <b>O &amp; M:</b>1M</p> <p><b>Stakeholders:</b> KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Near-Term</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> <li>• Improve safety</li> </ul>	<p><b>Scope of Project:</b> The KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of expansion services it will provide including freeway control, network surveillance, traffic information dissemination, and work zone management. These are the services that KDOT expects to enhance by adding additional field equipment in the medium-term.</p> <p>The KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of services it will provide including freeway control, network surveillance, traffic information dissemination, work zone management,</p> <p>The KDOT Freeway Control service provides the communications and roadside equipment to support ramp control, lane controls, and interchange control for the freeway system operated by KDOT. Coordination and integration of ramp meters are included as part of this service. This service uses the information from the City of Wichita and Sedgwick County Network Surveillance Service to support freeway monitoring and future adaptive strategies to manage traffic congestion.</p> <p>This service also includes the capability to utilize surveillance information for detection of incidents. Typically, the processing would be performed at the KDOT Traffic Operations Center.</p> <p>The KDOT Network Surveillance service includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the KDOT Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the KDOT Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The Traffic Information Dissemination service provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information.</p>
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<p>and efficiency</p> <ul style="list-style-type: none"> <li>• More effective traffic management</li> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring of environmental conditions</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Freeway Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> <li>• Road Weather Data Collection</li> <li>• Roadway Automated Treatment</li> <li>• Work Zone Management</li> <li>• Maintenance and Construction Activity Coordination</li> <li>• ITS Data Mart</li> <li>• ITS Data Warehouse</li> </ul>	<p>This service covers the equipment and interfaces that provide traffic information from the KDOT Traffic Operations Center to the media (for instance via a direct tie-in between these traffic management centers and radio or television station computer systems), Wichita Transit Operations Center, Wichita Transit Customer Information System, Sedgwick County 911, and other Public Safety agencies via the KDOT TOC Information System. A link to the KDOT and Wichita-Sedgwick County Maintenance and Construction agencies allows dissemination of real time information on road closures due to maintenance and construction activities.</p> <p>In addition, it is envisioned that there will be a regional 5-1-1 traveler information telephone service for the Wichita area. The KDOT TOC for the Wichita region is expected to provide this 5-1-1 capability including local transit and roadway information. How the Wichita regional 5-1-1 system will integrate with the Kansas state-wide 5-1-1 system is being developed at this time.</p> <p>The KDOT Work Zone Management service directs activity in KDOT's work zones, controlling traffic through portable dynamic message signs (DMS) and informing other groups of activity (e.g., KDOT TOC Information System, Wichita Traffic Operations Center, other Wichita-Sedgwick and Suburban maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones</p>
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**Project # 4E**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Long-Term</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 5 years</p> <p><b>Project Cost:</b> <b>Capital:</b>6.2M <b>O &amp; M:</b>1.2M</p> <p><b>Stakeholders:</b> KDOT Kansas Highway Patrol Kansas Turnpike Authority Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> KDOT Traffic Operations Center (TOC) Wichita Metro – Medium-Term</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Surveillance and monitoring capabilities</li> <li>• More responsive incident management</li> </ul>	<p><b>Scope of Project:</b> The KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of expansion services it will provide including freeway control, network surveillance, traffic information dissemination, and work zone management. These are the services that KDOT expects to enhance by adding additional field equipment in the long-term.</p> <p>The KDOT Traffic Operations Center (TOC) for the Wichita Metropolitan area has a number of services it will provide including freeway control, network surveillance, traffic information dissemination, work zone management,</p> <p>The KDOT Freeway Control service provides the communications and roadside equipment to support ramp control, lane controls, and interchange control for the freeway system operated by KDOT. Coordination and integration of ramp meters are included as part of this service. This service uses the information from the City of Wichita and Sedgwick County Network Surveillance Service to support freeway monitoring and future adaptive strategies to manage traffic congestion.</p> <p>This service also includes the capability to utilize surveillance information for detection of incidents. Typically, the processing would be performed at the KDOT Traffic Operations Center.</p> <p>The KDOT Network Surveillance service includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the KDOT Traffic Operations Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the KDOT Traffic Operations Center). The data generated by this service enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users in the Wichita Regional ITS Architecture.</p> <p>The Traffic Information Dissemination service provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information.</p> <p>This service covers the equipment and interfaces that provide traffic information from the KDOT Traffic Operations Center to the media (for</p>
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<ul style="list-style-type: none"> <li>• Improve safety and efficiency</li> <li>• More effective traffic management</li> <li>• Real-time traveler information</li> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Network Surveillance</li> <li>• Freeway Control</li> <li>• Traffic Information Dissemination</li> <li>• Traffic Incident Management System</li> <li>• Road Weather Data Collection</li> <li>• Roadway Automated Treatment</li> <li>• Work Zone Management</li> <li>• Maintenance and Construction Activity Coordination</li> <li>• ITS Data Mart</li> <li>• ITS Data Warehouse</li> </ul>	<p>instance via a direct tie-in between these traffic management centers and radio or television station computer systems), Wichita Transit Operations Center, Wichita Transit Customer Information System, Sedgwick County 911, and other Public Safety agencies via the KDOT TOC Information System. A link to the KDOT and Wichita-Sedgwick County Maintenance and Construction agencies allows dissemination of real time information on road closures due to maintenance and construction activities.</p> <p>In addition, it is envisioned that there will be a regional 5-1-1 traveler information telephone service for the Wichita area. The KDOT TOC for the Wichita region is expected to provide this 5-1-1 capability including local transit and roadway information. How the Wichita regional 5-1-1 system will integrate with the Kansas state-wide 5-1-1 system is being developed at this time.</p> <p>The KDOT Work Zone Management service directs activity in KDOT's work zones, controlling traffic through portable dynamic message signs (DMS) and informing other groups of activity (e.g., KDOT TOC Information System, Wichita Traffic Operations Center, other Wichita-Sedgwick and Suburban maintenance and construction centers) for better coordination management. Work zone speeds and delays are provided to the motorist prior to the work zones</p>
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**Project # 5A**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Wichita Area WiMax Communications Site Survey and Design Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b>300K <b>O &amp; M:</b></p> <p><b>Stakeholders:</b> City of Wichita KDOT Sedgwick County</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Wide area wireless communications limit dependence on leased lines</li> <li>• Flexible communications options</li> <li>• Secondary communications for public safety</li> </ul> <p><b>Market Packages to Consider:</b> None</p>	<p><b>Scope of Project:</b> This WiMax communications design project will involve site surveys and design of a WiMax system within the City of Wichita limits. A portion of this network is planned to be used by transit vehicles and as a secondary communications network for public safety vehicles.</p>
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**Project # 5B**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Wichita Area WiMax Public Safety Vehicle Communications Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 2.7M <b>O &amp; M:</b> 300K</p> <p><b>Stakeholders:</b> City of Wichita KDOT Sedgwick County</p> <p><b>Project Dependencies:</b> Wichita Area WiMax Communications Site Survey and Design Project</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Wide area wireless communications limit dependence on leased lines</li> <li>• Flexible communications options</li> <li>• Secondary communications for public safety</li> </ul> <p><b>Market Packages to Consider:</b> None</p>	<p><b>Scope of Project:</b> This WiMax public safety vehicle communications project will involve outfitting public safety vehicles so they can communicate wirelessly within the City of Wichita limits. The WiMax will enable non-critical communications as well as provide a secondary communications network for public safety vehicles in addition to their 800MHz radios.</p>
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**Project # 5C**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Wichita Area WiMax Wichita Transit Vehicle Communications Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b>200K <b>O &amp; M:</b> 50K</p> <p><b>Stakeholders:</b> City of Wichita KDOT Sedgwick County Wichita Transit</p> <p><b>Project Dependencies:</b> Wichita Area WiMax Communications Site Survey and Design Project</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Wide area wireless communications limit dependence on leased lines</li> <li>• Flexible communications options</li> <li>• Transit vehicle fleet communications enables transit applications</li> </ul> <p><b>Market Packages to Consider:</b> None</p>	<p><b>Scope of Project:</b> This WiMax transit vehicle communications project will involve outfitting public safety vehicles so they can communicate wirelessly within the City of Wichita limits. The communications capability will allow for transit vehicle to transit center communications and enable tracking transit vehicles as well as demand management. Fare and passenger information and traveler information can also be shared via this communications technology.</p>
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**Project # 6**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Air Quality Alert System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 100K <b>O &amp; M:</b> 10K</p> <p><b>Stakeholders:</b> City of Wichita Dept. of Env. Health KDHE – Kansas Department of Health and Environment Media</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Air quality monitoring</li> <li>• More effective environment management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Emissions Monitoring and Management</li> </ul>	<p><b>Scope of Project:</b> The Emissions Monitoring and Management service monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. This capability will only be instituted if the region reaches non-attainment levels. The collected information is transmitted to the Air Quality Alert system for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this service. For area wide monitoring, this service measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores and reports supporting statistical data. For point emissions monitoring, this service measures tail pipe emissions and identifies vehicles that exceed emissions standards. Summary emissions information or warnings can also be displayed to drivers. The gathered information can be used to implement environmentally sensitive transportation demand programs, policies, and regulations.</p>
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**Project # 7**

<p><b>Category:</b> Travel and Traffic Management</p> <p><b>Project Title:</b> Railroad Grade Crossing System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 750K <b>O &amp; M:</b> 75K</p> <p><b>Stakeholders:</b> Sedgwick County City of Wichita Railroads</p> <p><b>Project Dependencies:</b> City of Wichita ITS Signal System Upgrade Project Implementation</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Improved safety</li> <li>• More effective traffic management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Standard Railroad Grade Crossing</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Standard Railroad Grade Crossing service manages highway traffic at highway-rail intersections (HRIs) in the Wichita region where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the roadway subsystem and the driver in the architecture definition.) These traditional HRI warning systems may also be augmented with other standard traffic management devices.</p> <p>The warning systems are activated on notification by interfaced wayside equipment of an approaching train. The Wayside Equipment HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the Wayside Equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the Wichita Traffic Operations Center.</p>
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**Project # 8**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 320K <b>O &amp; M :</b> 32K</p> <p><b>Stakeholders:</b> Sedgwick County</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient use of maintenance fleet</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Maintenance and Construction Vehicle and Equipment Tracking</li> <li>• Roadway Maintenance and Construction</li> </ul>	<p><b>Scope of Project:</b> The Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking service will track the location of Sedgwick County maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.</p>
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**Project # 9**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> KDOT Maintenance and Construction Vehicle and Equipment Tracking System</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b>320K <b>O &amp; M :</b>32K</p> <p><b>Stakeholders:</b> KDOT</p> <p><b>Project Dependencies:</b> None – however this project is dependent on the Kansas Statewide 800MHz Communications System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient use of maintenance fleet</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Maintenance and Construction Vehicle and Equipment Tracking</li> <li>• Roadway Maintenance and Construction</li> </ul>	<p><b>Scope of Project:</b> The KDOT Maintenance and Construction Vehicle and Equipment Tracking service will track the location of KDOT maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.</p>
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**Project # 10**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> City Of Wichita Maintenance and Construction Vehicle and Equipment Tracking System</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 700K <b>O &amp; M :</b> 70K</p> <p><b>Stakeholders:</b> City Of Wichita</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient use of maintenance fleet</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Maintenance and Construction Vehicle and Equipment Tracking</li> <li>• Roadway Maintenance and Construction</li> </ul>	<p><b>Scope of Project:</b> The Wichita Maintenance and Construction Vehicle and Equipment Tracking service will track the location of the City of Wichita maintenance and construction vehicles, including inspection vehicles, and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.</p>
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**Project # 11**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> KDOT Seasonal Maintenance System</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b>600K <b>O &amp; M :</b>60K</p> <p><b>Stakeholders:</b> KDOT NOAA</p> <p><b>Project Dependencies:</b> KDOT Maintenance and Construction Vehicle and Equipment Tracking System In addition, this project is dependent on the Kansas Statewide 800MHz Communications System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Winter Maintenance</li> </ul>	<p><b>Scope of Project:</b> The KDOT Seasonal Maintenance service supports KDOT's winter and other seasonal road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), other snow and ice control activities and roadway striping/paving. This service monitors environmental conditions and weather forecasts and uses the information to schedule maintenance activities, determine the appropriate response, and track and manage response operations.</p>
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**Project # 12**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> Sedgwick County Seasonal Maintenance System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b>200K <b>O &amp; M :</b>20K</p> <p><b>Stakeholders:</b> NOAA Sedgwick County</p> <p><b>Project Dependencies:</b> Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Winter Maintenance</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Sedgwick County Seasonal Maintenance service supports Sedgwick County's winter and other seasonal road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), other snow and ice control activities and roadway striping/paving. This service monitors environmental conditions and weather forecasts and uses the information to schedule seasonal maintenance activities, determine the appropriate response, and track and manage response operations.</p>
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**Project # 13**

<p><b>Category:</b> Maintenance and Construction Management</p> <p><b>Project Title:</b> City of Wichita Seasonal Maintenance System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b>500K <b>O &amp; M :</b>50K</p> <p><b>Stakeholders:</b> NOAA City of Wichita</p> <p><b>Project Dependencies:</b> City Of Wichita Maintenance and Construction Vehicle and Equipment Tracking System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More efficient winter maintenance management</li> <li>• More effective monitoring environmental condition</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Winter Maintenance</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Wichita Seasonal Maintenance service supports the City of Wichita's winter and seasonal road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), other snow and ice control activities and roadway striping/paving. This service monitors environmental conditions and weather forecasts and uses the information to schedule maintenance activities, determine the appropriate response, and track and manage response operations.</p>
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**Project # 14**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> Sedgwick County Department on Aging Transit Vehicle Tracking System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 100K <b>O &amp; M :</b> 10K</p> <p><b>Stakeholders:</b> Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Provides transit vehicle tracking capability</li> <li>• Provides real time transit schedule</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Vehicle Tracking</li> </ul>	<p><b>Scope of Project:</b> The Sedgwick County Department on Aging Transit Vehicle Tracking service monitors current Sedgwick County Department of Aging Transit Vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Sedgwick County Transportation Brokerage System is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Sedgwick County Transportation Brokerage System processes this information, updates the transit schedule and makes real-time schedule information available to users.</p>
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**Project # 15**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> City of Wichita Transit Vehicle Tracking System</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 1M <b>O &amp; M :</b> 100K</p> <p><b>Stakeholders:</b> City of Wichita Sedgwick County</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Provides transit vehicle tracking capability</li> <li>• Provides real time transit schedule</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Vehicle Tracking</li> <li>• Transit Fixed-Route Operations</li> </ul>	<p><b>Scope of Project:</b> The Wichita Transit Vehicle Tracking service monitors current City of Wichita Transit Vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. Vehicle position may be determined either by the vehicle (e.g., through GPS) and relayed to the infrastructure or may be determined directly by the communications infrastructure. A two-way wireless communication link with the Wichita Transit Operations Center is used for relaying vehicle position and control measures. Fixed route transit systems may also employ beacons along the route to enable position determination and facilitate communications with each vehicle at fixed intervals. The Wichita Transit Operations Center processes this information, updates the transit schedule and makes real-time schedule information available to the Wichita Transit Customer Information System.</p> <p>The Transit Fixed-Route Operations service performs vehicle routing and scheduling for the Wichita Transit Operations Center, as well as automatic operator assignment and system monitoring for fixed-route and flexible-route transit services. This service determines current schedule performance using AVL data and provides information displays at the Wichita transit Operations Center. Static and real time transit data is exchanged with the Wichita Transit Customer Information System where it has the ability to be integrated with other transportation modes (e.g. rail, air) to provide the public with integrated and personalized dynamic schedules.</p>
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**Project # 16**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> Sedgwick County Department of Aging Demand Response Transit System</p> <p><b>Time Frame:</b> Long-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b>50K <b>O &amp; M :</b>5K</p> <p><b>Stakeholders:</b> Sedgwick County</p> <p><b>Project Dependencies:</b> Sedgwick County Department on Aging Transit Vehicle Tracking System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More effective transit management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Reduced Delay</li> </ul>	<p><b>Scope of Project:</b> The Sedgwick County Department on Aging Demand Response Transit Operations service performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for the Sedgwick County Transportation Brokerage System demand responsive transit services. In addition, this service performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the Sedgwick County Transportation Brokerage System transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Sedgwick County Transportation Brokerage System provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet.</p>
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**Project # 17**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> City of Wichita Transit Fixed- Route Demand Response Transit System</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b> 100K <b>O &amp; M :</b> 10K</p> <p><b>Stakeholders:</b> City of Wichita</p> <p><b>Project Dependencies:</b> City of Wichita Transit Vehicle Tracking System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More effective transit management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Demand Response Transit Operations</li> </ul>	<p><b>Scope of Project:</b> The Wichita Transit Fixed-Route Demand Response Transit Operations service performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for the Wichita Transit Operations Center fixed-route demand responsive transit services. In addition, this service performs similar functions to support dynamic features of flexible-route transit services. This package monitors the current status of the Wichita Transit Operations Center transit fleet and supports allocation of these fleet resources to service incoming requests for transit service while also considering traffic conditions. The Wichita Transit Operations Center provides the necessary data processing and information display to assist the transit operator in making optimal use of the transit fleet.</p>
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**Project # 18**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> City of Wichita Personalized Para- Transit Services</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b>100K <b>O &amp; M :</b>10K</p> <p><b>Stakeholders:</b> City of Wichita</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Provides personalized transit service</li> <li>• More effective transit management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Traveler Information</li> <li>• Interactive Traveler Information</li> <li>• ITS Data Mart</li> <li>• ITS Data Warehouse</li> </ul>	<p><b>Scope of Project:</b> This service includes the capability for a traveler request for personalized transit services to be made through the Wichita Transit Customer Information System. The Wichita Transit Customer Information System may either be operated by the Wichita Transit Operations Center or be independently owned and operated by a separate service provider. In the first scenario, the traveler makes a direct request to a specific paratransit service. In the second scenario, a third party service provider determines that the paratransit service is a viable means of satisfying a traveler request and makes a reservation for the traveler.</p>
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**Project # 19**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> Wichita Transit Passenger and Fare Management System</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b>200K <b>O &amp; M :</b>20K</p> <p><b>Stakeholders:</b> City of Wichita Wichita Transit</p> <p><b>Project Dependencies:</b> City of Wichita Transit Vehicle Tracking System</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More effective transit passenger and fare management</li> <li>• Provides transit traveler card</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Passenger and Fare Management</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Transit Passenger and Fare Management service allows transit users to use a traveler card or other electronic payment device. Sensors mounted on the vehicle permit the operator and central operations to determine vehicle loads, and readers located either in the infrastructure or on-board the Wichita Transit vehicle allow electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Wichita Transit Operations Center.</p>
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**Project # 20**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> Wichita Transit Security System</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 4 years</p> <p><b>Project Cost:</b> <b>Capital:</b>400K <b>O &amp; M :</b>40K</p> <p><b>Stakeholders:</b> City of Wichita Wichita Transit</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More secure transit operation</li> <li>• Provide surveillance and sensor information</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Security</li> </ul>	<p><b>Scope of Project:</b> The Transit Security service provides for the physical security of transit passengers and Wichita Transit vehicle operators. On-board equipment is deployed to perform surveillance and sensor monitoring in order to warn of potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. Transit user or Wichita transit vehicle operator activated alarms are provided on-board.</p> <p>Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service provides surveillance and sensor monitoring of non-public areas of Wichita transit facilities (e.g., transit yards) and transit infrastructure such as bridges and tunnels.</p>
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**Project # 21**

<p><b>Category:</b> Public Transportation Management</p> <p><b>Project Title:</b> Transit Traveler Information System</p> <p><b>Time Frame:</b> Near-Term to Medium-Term</p> <p><b>Duration:</b> 3 years</p> <p><b>Project Cost:</b> <b>Capital:</b>200K <b>O &amp; M :</b>20K</p> <p><b>Stakeholders:</b> KDOT Media City of Wichita</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• Provides transit information</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Transit Traveler Information</li> <li>• Broadcast Traveler Information</li> </ul>	<p><b>Scope of Project:</b> The Transit Traveler Information service provides transit users at transit stops and on-board transit vehicles with ready access to transit information in the Wichita-Sedgwick County regional area. The information services include transit stop annunciation, imminent arrival signs, transit information from kiosks and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service.</p>
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**Project # 22**

<p><b>Category:</b> Emergency Management</p> <p><b>Project Title:</b> Public Safety AVL Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 3 years</p> <p><b>Project Cost:</b> <b>Capital:</b>2.5M <b>O &amp; M :</b>175K</p> <p><b>Stakeholders:</b> KDOT Sedgwick County City of Wichita Public Safety Agencies</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More responsive emergency management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Emergency Call-Taking and Dispatch</li> <li>• ITS Data Mart</li> </ul>	<p><b>Scope of Project:</b> The Sedgwick County 911/EOC Emergency Call-Taking and Dispatch service provides basic Sedgwick County 911 call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Sedgwick County 911 and other public safety agencies in the Wichita-Sedgwick County region supports emergency notification between agencies. Wide area wireless communications between the Sedgwick County 911 and other public safety agencies vehicles in the Wichita-Sedgwick County area support dispatch and provision of information to responding personnel.</p> <p>In support of these services, Sedgwick County 800MHz mobile data system will be deployed.</p>
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**Project # 23**

<p><b>Category:</b> Emergency Management</p> <p><b>Project Title:</b> Suburban Communities AVL Project</p> <p><b>Time Frame:</b> Near-Term</p> <p><b>Duration:</b> 3 years</p> <p><b>Project Cost:</b> <b>Capital:</b>225K <b>O &amp; M :</b>20K</p> <p><b>Stakeholders:</b> Suburban Communities Public Safety Agencies</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More responsive emergency management</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Emergency Call-Taking and Dispatch</li> <li>• ITS Data Mart</li> </ul>	<p><b>Scope of Project:</b></p> <p>The Suburban Emergency Call-Taking and Dispatch service provides basic emergency call-taking and dispatch services for suburban communities not served by the Sedgwick County 911 system. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between the various suburban emergency call-taking and dispatch systems and the Sedgwick County 911 supports emergency notification between agencies. Wide area wireless communications between the Suburban Emergency Dispatch Center and Suburban Public Safety Vehicles support dispatch and provision of information to responding personnel.</p> <p>It is envisioned in the future to have the public safety agencies in the suburban communities deploy equipment compatible with the Sedgwick County 800MHz mobile data system.</p>
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**Project # 24**

<p><b>Category:</b> Emergency Management</p> <p><b>Project Title:</b> Sedgwick County 911 Emergency Routing Project</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 2 years</p> <p><b>Project Cost:</b> <b>Capital:</b>500K <b>O &amp; M :</b>50K</p> <p><b>Stakeholders:</b> Kansas Highway Patrol Kansas Turnpike Authority KDOT Sedgwick County City of Wichita</p> <p><b>Project Dependencies:</b> Public Safety AVL Project</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More responsive emergency management</li> <li>• Improved public safety</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Emergency Routing</li> </ul>	<p><b>Scope of Project:</b> The Sedgwick County 911 Emergency Routing service supports automated vehicle location and dynamic routing of Wichita-Sedgwick County area public safety vehicles. Traffic information, road conditions, and suggested routing information are provided to enhance emergency vehicle routing as part of the Computer-Aided Dispatch (CAD). Special priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The Sedgwick County 911 provides the routing for the emergency fleet based on real-time conditions and has the option of requesting a route from the KDOT Traffic Operations Center and Wichita Traffic Operations Center. The local public safety vehicles may also be equipped with dedicated short range communication devices for local signal preemption.</p>
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**Project # 25**

<p><b>Category:</b> Emergency Management</p> <p><b>Project Title:</b> Wichita Mid-Continent Airport Emergency Routing Project</p> <p><b>Time Frame:</b> Medium-Term</p> <p><b>Duration:</b> 1 year</p> <p><b>Project Cost:</b> <b>Capital:</b> 100K <b>O &amp; M :</b> 10K</p> <p><b>Stakeholders:</b> Wichita Airport Authority</p> <p><b>Project Dependencies:</b> None.</p> <p><b>Expected Benefits:</b></p> <ul style="list-style-type: none"> <li>• More responsive emergency management</li> <li>• Improved public safety</li> </ul> <p><b>Market Packages to Consider:</b></p> <ul style="list-style-type: none"> <li>• Emergency Routing</li> <li>• ITS Data Mart</li> </ul>	<p><b>Scope of Project:</b> The Wichita Mid-Continent Airport Emergency Routing service supports automated vehicle location and dynamic routing of Wichita Mid-Continent Airport Public Safety Vehicles. Traffic information, road conditions, and suggested routing information are provided to enhance emergency vehicle routing. Special priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The Wichita Mid-Continent and Jabara Airports provide the routing for their public safety fleet based on real-time conditions.</p>
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## 4 Project Sequencing

### 4.1 Project Schedule

Table 3 illustrates the deployment plan schedule for the proposed projects, grouped by area of interest. As described previously, the schedule follows a Near-Term Plan, a Medium-Term Plan, and a Long-Term Plan showing only the project duration in terms of capital costs; operations and maintenance is assumed at the endpoint of the project. Since priorities and institutional objectives change over time, the deployment plan schedule should be periodically re-evaluated annually.

**Table 3. ITS Deployment Plan Schedule**

Project Name		Year 1	Year 2	Year 3	Year 4	Year 5
<b>NEAR-TERM PROJECTS( Projects developed in years 1 to 5 )</b>						
1	City of Wichita Traffic Operation Center					
2A	City of Wichita ITS Signal System Upgrade Study Project					
2B	City of Wichita ITS Signal System Upgrade project Design					
2C	City of Wichita ITS Signal System Upgrade Project Implementation					
4A	KDOT Ramp Metering Project					
4B	KDOT Traffic Operations Center (TOC) Wichita Metro – Design					
4C	KDOT Traffic Operations Center (TOC) Wichita Metro – Near -Term					
5A	Wichita Area WiMax Communications Site Survey and Design Project					
5B	Wichita Area WiMax Public Safety Vehicle Communications Project					
5C	Wichita Area WiMax Transit Vehicle Communications Project					
15	City of Wichita Transit Vehicle Tracking System					
17	City of Wichita Transit Fixed-Route Demand Response Transit System					

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Project Name		Year 1	Year 2	Year 3	Year 4	Year 5
<b>NEAR-TERM PROJECTS( Projects developed in years 1 to 5 )</b>						
18	City of Wichita Personalized Para-Transit Services					
19	Wichita Transit Passenger and Fare Management System					
20	Wichita Transit Security System					
21	Transit Traveler Information System					
22	Public Safety AVL Project					
23	Suburban Communities AVL Project					

Project Name		Year 6	Year 7	Year 8	Year 9	Year 10
<b>MEDIUM-TERM PROJECTS( Projects developed in years 6 to 10 )</b>						
2C	City of Wichita ITS Signal System Upgrade Project Implementation					
2D	City of Wichita ITS Signal System Project for Sedgwick County					
3	Regional Traffic and Incident Management					
4D	KDOT Traffic Operations Center (TOC) Wichita Metro – Medium – Term					
9	KDOT Maintenance and Construction Vehicle and Equipment Tracking System					
10	City Of Wichita Maintenance and Construction Vehicle and Equipment					
11	KDOT Seasonal Maintenance System					
14	Sedgwick County Department on Aging Transit Vehicle Tracking System					
21	Transit Traveler Information System					

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Project Name		Year 6	Year 7	Year 8	Year 9	Year 10
<b>MEDIUM-TERM PROJECTS( Projects developed in years 6 to 10 )</b>						
24	Sedgwick County 911 Emergency Routing Project	██████████				
25	Wichita Mid-Continent Airport Emergency Routing Project	██████				

Project Name	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
<b>LONG-TERM PROJECTS( Projects developed in years 11 to 20 )</b>										
2C	City of Wichita ITS Signal System Upgrade Project Implementation	██████								
4E	KDOT Traffic Operations Center (TOC) Wichita Metro – Long – Term	██								
6	Air Quality Alert System	██████								
7	Railroad Grade Crossing System	██████████								
8	Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System	██████████								
12	Sedgwick County Seasonal Maintenance System		██████							
13	City of Wichita Seasonal Maintenance System	██████								
16	Sedgwick County Department on Aging Demand Response Transit System	██████								

## 4.2 Project Costs

### 4.2.1 Capital Costs

The following table shows the expected capital costs for each year. Currently, there are no new projects scheduled after year 15.

<b>Timeframe</b>	<b>Capital Costs</b>
<b>Year 1</b>	<b>\$2,203,333</b>
<b>Year 2</b>	<b>\$6,308,333</b>
<b>Year 3</b>	<b>\$2,625,000</b>
<b>Year 4</b>	<b>\$6,883,334</b>
<b>Year 5</b>	<b>\$6,908,334</b>
<b>Year 6</b>	<b>\$2,551,667</b>
<b>Year 7</b>	<b>\$3,335,000</b>
<b>Year 8</b>	<b>\$3,475,000</b>
<b>Year 9</b>	<b>\$3,175,000</b>
<b>Year 10</b>	<b>\$2,375,000</b>
<b>Year 11</b>	<b>\$3,550,000</b>
<b>Year 12</b>	<b>\$1,975,000</b>
<b>Year 13</b>	<b>\$1,240,000</b>
<b>Year 14</b>	<b>\$1,240,000</b>
<b>Year 15</b>	<b>\$1,240,000</b>
<b>Year 16</b>	
<b>Year 17</b>	
<b>Year 18</b>	
<b>Year 19</b>	
<b>Year 20</b>	

**4.2.2 Capital Costs plus O&M**

The following table shows the expected capital costs including O&M costs for each year.

<b>Timeframe</b>	<b>Capital Costs</b>
<b>Year 1</b>	<b>\$2,203,333</b>
<b>Year 2</b>	<b>\$6,448,666</b>
<b>Year 3</b>	<b>\$3,337,999</b>
<b>Year 4</b>	<b>\$7,613,434</b>
<b>Year 5</b>	<b>\$8,269,500</b>
<b>Year 6</b>	<b>\$4,725,667</b>
<b>Year 7</b>	<b>\$5,853,500</b>
<b>Year 8</b>	<b>\$6,324,000</b>
<b>Year 9</b>	<b>\$6,748,500</b>
<b>Year 10</b>	<b>\$6,301,000</b>
<b>Year 11</b>	<b>\$7,018,500</b>
<b>Year 12</b>	<b>\$6,156,500</b>
<b>Year 13</b>	<b>\$5,943,000</b>
<b>Year 14</b>	<b>\$6,067,000</b>
<b>Year 15</b>	<b>\$6,191,000</b>
<b>Year 16</b>	<b>\$5,531,000</b>
<b>Year 17</b>	<b>\$5,531,000</b>
<b>Year 18</b>	<b>\$5,531,000</b>
<b>Year 19</b>	<b>\$5,531,000</b>
<b>Year 20</b>	<b>\$5,531,000</b>

## **5 ITS Standards**

### **5.1 Introduction**

Standardizing the flow of information between the systems in the Wichita region is essential to integrating ITS throughout the region. ITS standards are fundamental to the establishment of an open ITS environment that achieves the goal of interoperability desirable for ITS. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve.

Establishing standards for exchanging information among ITS systems is important not only from an interoperability point of view; it also provides interchangeability and expandability thereby reducing risk and cost. Since an agency using standardized interfaces can select among multiple vendors for products and applications, competition is maintained and prices are lower in the long term.

Standards Development Organizations (SDO) are developing ITS standards that support interoperability and interchangeability. Several of the communication standards overlap in applicability. This provides flexibility in the design of ITS systems allowing agencies to choose the most applicable standard for their needs. Before systems are designed, all stakeholders involved in the applicable ITS service(s) should decide upon the standards and their specifics that will be used. Once a decision is made, all future systems should use the agreed upon standards.

Currently there are almost 100 ITS standards, but not all of these standards will be used in the Wichita region. The Wichita-Sedgwick County ITS Architecture references only those standards that are applicable to the interfaces between the ITS systems of the region. The set of standards for the Wichita region is based on the architecture flows on the system interfaces which were included in the Architecture. Section 5.5 presents the standards applicable to the ITS deployments in the Wichita region. Appendix D contains the standards applicable to each architecture flow in the Wichita-Sedgwick County Regional ITS Architecture.

In addition to the interface standards that have been discussed and are being defined for ITS, a range of other standards may be considered that would facilitate interoperability and implementation of the ITS architecture. For example, standard base maps, naming conventions and measurement and location standards can help facilitate efficient and meaningful exchange of information between systems in the region.

### **5.2 Standards Development Organizations (SDOs)**

The ITS community recognized the advantages of standards and encouraged Standards Development Organizations (SDOs) or equivalents to create ITS standards between the most critical ITS interfaces. The following is a list of SDOs or equivalents that are developing ITS standards. This list provides acronyms that show up repeatedly throughout the list of standards applicable to the Wichita region:

American National Standards Institute (ANSI)  
American Society for Testing and Materials (ASTM)  
Electronic Industries Alliance (EIA)  
Institute of Electrical and Electronics Engineers (IEEE)  
Institute of Transportation Engineers (ITE)  
Society of Automotive Engineers (SAE)  
National Transportation Communications for ITS Protocol (NTCIP)

NTCIP is really a joint product of the National Electronic Manufacturers Association (NEMA), the American Association of State Highway and Transportation Officials (AASHTO), and ITE. NTCIP is a family of standards for traffic and transit systems.

### **5.3 Stages of Standards Development**

There are numerous levels of maturity or stages of development for standards. The process varies between SDOs but some of the common stages include:

**Draft Under Development.** During this phase, there are significant changes likely to occur.

**Draft for Ballot or in Balloting.** Standards being voted upon by a committee or working group or are undergoing other SDO procedures.

**Approved.** Standards that have passed all necessary ballots and have been approved by an SDO, but have not yet been published.

**Published.** Standards available for purchase and use. Note: currently some of the SDOs, most notably the NTCIP group are providing particular ITS standards for free for a limited time.

**Tested/Deployed Standard.** Only minor changes are likely to occur in this phase of a standard development.

It's important to understand at what stage, in the typical development cycle, a standard is in, especially if you are considering the inclusion of a specific standard in procurement specifications. Early in the cycle before approval or publishing, there are many changes to a standard. Many standards have yet to undergo testing or initial deployment.

The US DOT standards website <http://www.standards.its.dot.gov/standards.htm> contains the latest status of each ITS standard as well as supporting information about the standards. Other information that can be obtained from this website are pointers to general information, including status charts for each ITS standard, web links, standards deployments and training courses.

### **5.4 Strategy for Using the ITS Standards**

In the Wichita region, very little ITS has been deployed in the past so it is important to start with the national standards. The use of ITS standards in procurement specifications often depends on

how much risk can be afforded. There are often lots of changes to an early standard and even some risk of change in a balloted standard. Also, early deployers will likely have suggested improvements to the standard that will require an update via an amendment to the standard (amendments do typically pass through the process more quickly).

In addition to understanding the relative maturity of the standards, making proper choices for standards depends on multiple factors, including throughput (how much data must be transmitted or received on the interface), network topology (how the ITS systems are connected together), and infrastructure (fiber optic lines, leased land lines, etc.), among others. Some of these issues are discussed in the Volume 3 Communications Plan.

New systems should be deployed using ITS standards. To guide stakeholders in the choice of standards, the next section contains the initial list of ITS Standards derived directly from the information flows contained in the Wichita-Sedgwick County Regional ITS Architecture. The ITS Standards can be grouped into two broad categories: Center-to-Field and Center-to-Center. The Center-to-Field (C2F) standards are primarily overseen by the NTCIP Joint Committee that is comprised, as was mentioned before, of representatives from AASHTO, NEMA and ITE. NTCIP is also responsible for the transport protocols for center-to-center (C2C) standards. Other Standards Development Organizations are responsible for defining the message set content. IEEE is responsible for Incident Management, SAE for traveler information, ITE/AASHTO for traffic management and ITE/APTA for transit. In addition there is a combined effort to define the Dedicated Short Range Communications standards in the 5.9GHz range, now called WAVE or Wireless Access in a Vehicular Environment for vehicle-to-field and vehicle-to-vehicle communications.

It is common to have a family of standards for a particular transportation domain and those families have been placed in groups below with a footnote explaining each group. It is important to note that some groups contain standards that are redundant with each other (i.e., accomplish the same purpose) so it requires choosing the best standard that satisfies the region's requirements. For example, there are currently 3 center-to-center transport protocol standards: DATEX-ASN, CORBA and XML. Most regions would not deploy all three transport protocol standards; they would most likely choose one or maybe two. For the Wichita-Sedgwick County region, it is recommended that the new NTCIP 2306 Application Profile for XML Communications standards, currently in User Comment Draft status, be strongly considered for regional center-to-center communications. The XML standard, although not as bandwidth efficient as DATEX-ASN or feature driven as CORBA, is a nice compromise and there are volumes of XML literature to rely on.

Most ITS standards also have mandatory and optional parts to them. It is incumbent on the project RFP's to not only specify the standard and its version but also what optional functionality is required. The US DOT standards website <http://www.standards.its.dot.gov/standards.htm> contains the latest status of each ITS standard as well as supporting information about the standards.

As each ITS project explores the ITS standards, it is strongly encouraged that reports by those project elements be run using the Turbo Architecture tool. The Standards Activity report can provide standards down to the architecture flow level for each project.

## 5.5 Relevant Standards Activities

<b>AASHTO/ITE/NEMA</b>	<b>NTCIP Center-to-Center Standards Group</b>	<b>(See Footnote)</b>
<b>AASHTO/ITE/NEMA</b>	<b>NTCIP Center-to-Field Standards Group</b>	<b>(See Footnote)</b>
<b>AASHTO/ITE/NEMA</b>	<b>Global Object Definitions</b>	<b>NTCIP 1201</b>
<b>AASHTO/ITE/NEMA</b>	<b>Object Definitions for Actuated Traffic Signal Controller Units</b>	<b>NTCIP 1202</b>
<b>AASHTO/ITE/NEMA</b>	<b>Object Definitions for Dynamic Message Signs</b>	<b>NTCIP 1203</b>
<b>AASHTO/ITE/NEMA</b>	<b>Object Definitions for Environmental Sensor Stations &amp; Roadside Weather Information System</b>	<b>NTCIP 1204</b>
<b>AASHTO/ITE/NEMA</b>	<b>Data Dictionary for Closed Circuit Television (CCTV)</b>	<b>NTCIP 1205</b>
<b>AASHTO/ITE/NEMA</b>	<b>Data Collection &amp; Monitoring Devices</b>	<b>NTCIP 1206</b>
<b>AASHTO/ITE/NEMA</b>	<b>Ramp Meter Controller Objects</b>	<b>NTCIP 1207</b>
<b>AASHTO/ITE/NEMA</b>	<b>Object Definitions for Video Switches</b>	<b>NTCIP 1208</b>
<b>AASHTO/ITE/NEMA</b>	<b>Transportation System Sensor Objects</b>	<b>NTCIP 1209</b>
<b>AASHTO/ITE/NEMA</b>	<b>Objects for Signal Systems Master</b>	<b>NTCIP 1210</b>
<b>AASHTO/ITE/NEMA</b>	<b>Objects for Signal Control Priority</b>	<b>NTCIP 1211</b>

<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Common Public Transportation (CPT) Business Area Standard</b>	<b>NTCIP 1401</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Incident Management (IM) Business Area Standard</b>	<b>NTCIP 1402</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Passenger Information (PI) Business Area Standard</b>	<b>NTCIP 1403</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Scheduling/Runcutting (SCH) Business Area Standard</b>	<b>NTCIP 1404</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Spatial Representation (SP) Business Area Standard</b>	<b>NTCIP 1405</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Onboard (OB) Business Area Standard</b>	<b>NTCIP 1406</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Control Center (CC) Business Area Standard</b>	<b>NTCIP 1407</b>
<b>AASHTO/ITE/NEMA</b>	<b>TCIP - Fare Collection (FC) Business Area Standard</b>	<b>NTCIP 1408</b>
<b>ASTM</b>	<b>Dedicated Short Range Communication at 915 MHz Standards Group</b>	<b>(See Footnote)</b>
<b>ASTM</b>	<b>Standard Specification for Archiving ITS Generated Traffic Monitoring Data</b>	<b>ASTM E2259-xx</b>
<b>IEEE</b>	<b>Incident Management Standards Group</b>	<b>(See Footnote)</b>
<b>IEEE</b>	<b>Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a</b>	<b>IEEE 1570-2002</b>

**Highway Rail Intersection**

<b>IEEE</b>	<b>Standard for Message Sets for Vehicle/Roadside Communications</b>	<b>IEEE Std 1455-1999</b>
<b>ITE</b>	<b>Standard for Functional Level Traffic Management Data Dictionary (TMDD)</b>	<b>ITE TM 1.03</b>
<b>ITE</b>	<b>Message Sets for External TMC Communication (MS/ETMCC)</b>	<b>ITE TM 2.01</b>
<b>SAE</b>	<b>Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group</b>	<b>(See Footnote)</b>
<b>SAE</b>	<b>Advanced Traveler Information Systems (ATIS) General Use Standards Group</b>	<b>(See Footnote)</b>
<b>SAE/IEEE</b>	<b>Dedicated Short Range Communication at 5.9 GHz Standards Group</b>	<b>(See Footnote)</b>

**5.6 Standards Group Footnotes**

**Advanced Traveler Information Systems (ATIS) Bandwidth Limited Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
SAE	Location Referencing Message Specification (LRMS)	SAE J2266
SAE	Message Set for Advanced Traveler Information System (ATIS)	SAE J2354
SAE	Standard for ATIS Message Sets Delivered Over Bandwidth Restricted Media	SAE J2369
SAE	Rules for Standardizing Street Names and Route IDs	SAE J2529
SAE	Messages for Handling Strings and Look-Up Tables in ATIS Standards	SAE J2540
SAE	RDS (Radio Data System) Phrase List	SAE J2540-1

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SAE	ITIS (International Traveler Information Systems) Phrase Lists	SAE J2540-2
SAE	National Names Phrase List	SAE J2540-3
SAE	Converting ATIS Message Standards from ASN.1 to XML	SAE J2630

**Advanced Traveler Information Systems (ATIS) General Use Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
SAE	Location Referencing Message Specification (LRMS)	SAE J2266
SAE	Message Set for Advanced Traveler Information System (ATIS)	SAE J2354
SAE	Rules for Standardizing Street Names and Route IDs	SAE J2529
SAE	Messages for Handling Strings and Look-Up Tables in ATIS Standards	SAE J2540
SAE	RDS (Radio Data System) Phrase List	SAE J2540-1
SAE	ITIS (International Traveler Information Systems) Phrase Lists	SAE J2540-2
SAE	National Names Phrase List	SAE J2540-3
SAE	Converting ATIS Message Standards from ASN.1 to XML	SAE J2630

**Dedicated Short Range Communication at 5.9 GHz Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
IEEE	Resource Manager for DSRC 5.9 GHz	IEEE 1609.1
IEEE	Application Services (Layers 6,7) for DSRC 5.9 GHz	IEEE 1609.2
IEEE	Communications Services (Layers 4, 5) for DSRC 5.9 GHz (Future Standard)	IEEE 1609.3
IEEE	Medium Access Control (MAC) Extension & the MAC Extension Management Entity for DSRC 5.9 GHz	IEEE 1609.4
IEEE	Standard Specification for Telecommunications and Information Exchange Between Roadside and	IEEE 802.11

	Vehicle Systems - 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications	
IEEE	Logical Link (Layer 2) for DSRC 5.9 GHz	IEEE 802.2
ISO	Networking Services (Layer 3) for DSRC 5.9 GHz	ISO 21210

**Dedicated Short Range Communication at 915 MHz Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
ASTM	Standard Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz Band	ASTM E2158-01
ASTM	Standard Provisional Specification for Dedicated Short Range Communication (DSRC) Data Link Layer	ASTM PS 105-99

**Incident Management Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
IEEE	Standard for Traffic Incident Management Message Sets for Use by EMCs	IEEE 1512.1-2003
IEEE	Standard for Hazardous Material IMMS for use by EMCs	IEEE 1512.3-2002
IEEE	Standard for Common Incident Management Message Sets (IMMS) for use by EMCs	IEEE 1512-2000
IEEE	Standard for Public Safety IMMS for use by EMCs	IEEE P1512.2

**NTCIP Center-to-Center Standards Group**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
AASHTO/ITE/NEMA	Base Standard: Octet Encoding Rules (OER)	NTCIP 1102
AASHTO/ITE/NEMA	CORBA Naming Convention	NTCIP 1104

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AASHTO/ITE/NEMA	CORBA Security Service	NTCIP 1105
AASHTO/ITE/NEMA	CORBA Near-Real Time Data Service	NTCIP 1106
AASHTO/ITE/NEMA	Subnet Profile for Ethernet	NTCIP 2104
AASHTO/ITE/NEMA	Internet (TCP/IP and UDP/IP) Transport Profile	NTCIP 2202
AASHTO/ITE/NEMA	Application Profile for File Transfer Protocol (FTP)	NTCIP 2303
AASHTO/ITE/NEMA	Application Profile for Data Exchange ASN.1 (DATEX)	NTCIP 2304
AASHTO/ITE/NEMA	Application Profile for Common Object Request Broker Architecture (CORBA)	NTCIP 2305
AASHTO/ITE/NEMA	Information Profile for DATEX	NTCIP 2501
AASHTO/ITE/NEMA	Information Profile for CORBA	NTCIP 2502

**NTCIP Center-to-Field Standards Group  
SDO**

<b>SDO</b>	<b>Standard Name</b>	<b>Document ID</b>
AASHTO/ITE/NEMA	Simple Transportation Management Framework (STMF)	NTCIP 1101
AASHTO/ITE/NEMA	Base Standard: Octet Encoding Rules (OER)	NTCIP 1102
AASHTO/ITE/NEMA	Simple Transportation Management Protocol (STMP)	NTCIP 1103
AASHTO/ITE/NEMA	Point to Multi-Point Protocol Using RS-232 Subnetwork Profile	NTCIP 2101
AASHTO/ITE/NEMA	Subnet Profile for PMPP Over FSK modems	NTCIP 2102
AASHTO/ITE/NEMA	Subnet Profile for Point-to-Point Protocol using RS 232	NTCIP 2103
AASHTO/ITE/NEMA	Subnet Profile for Ethernet	NTCIP 2104
AASHTO/ITE/NEMA	Transportation Transport Profile	NTCIP 2201
AASHTO/ITE/NEMA	Internet (TCP/IP and UDP/IP) Transport Profile	NTCIP 2202
AASHTO/ITE/NEMA	Application Profile for Simple Transportation Management Framework (STMF)	NTCIP 2301
AASHTO/ITE/NEMA	Application Profile for Trivial File Transfer Protocol	NTCIP 2302
AASHTO/ITE/NEMA	Application Profile for File Transfer Protocol (FTP)	NTCIP 2303

## 6 Agency Agreements

### 6.1 Introduction

This project establishes a Regional Intelligent Transportation Systems (ITS) Architecture and develops an integrated ITS plan for Wichita-Sedgwick County region. The Regional Architecture and Strategic Deployment Plan will provide a frame work for current ITS elements in the region and a strategic approach for future ITS investments. The Iteris, Inc. project team is conducting this work under contract to the Wichita-Sedgwick County Metropolitan Area Planning Department (MAPD) in close consultation with the Federal Highway Administration (FHWA), the City of Wichita, the Kansas Department of Transportation (KDOT), and Sedgwick County.

The Regional ITS Architecture is required by the FHWA and the Federal Transit Administration (FTA) to provide regional integration so that planning and deployment of ITS solutions can take place in an organized and coordinated fashion throughout the Wichita-Sedgwick County region to improve transportation safety, efficiency, and security. The overall objective of the project is to ensure that ITS investments in the region:

- Have established common communication protocols;
- Avoid duplication of non-collaborative investments in infrastructure, hardware and software;
- Provide the ability to share data sources between agencies; and
- Bring the Wichita-Sedgwick County region into compliance with the nationally-established ITS standards and architecture.

### 6.2 Agency Agreements

Agreements among the different stakeholder agencies and organizations in the Wichita-Sedgwick County region may be required to realize the integration proposed in the regional ITS architecture. Each connection between systems in the regional ITS architecture represents cooperation between stakeholders and a potential requirement for an agreement.

In section 4, *Project Sequencing*, a series of projects were identified for the region that will provide new services or enhance existing ITS services. Delivering many of these services is an interagency effort and will require coordination, data and resource sharing, and potentially co-ownership of hardware and software. Agreements will be necessary to define and clarify ownership, roles and responsibilities for ITS in the region.

Typically, existing stakeholder agreements that support sharing of information, funding, or specific ITS projects are reviewed and assessed to determine if they can be extended and used to support the cooperative implementation and operation of ITS. For example, a joint funding agreement was developed between the City of Wichita, KDOT, and Sedgwick County to conduct the Signal System Upgrade Study (Project 2A). Other agreements are likely in place between various agencies, or have been used in the past, to provide transportation services. The list of the suggested agreements for the Wichita-Sedgwick County region developed in this Chapter is based on the regional operational concepts, knowledge of the types of ITS existing or planned for implementation by the region, and the information that needs to be exchanged in order to operate those systems.

### 6.2.1 Types of Agreements

There is considerable variation between regions and among stakeholders regarding the types of agreements that are created to support ITS integration. Table 4 contains descriptions of common types of agreements identified in the *FHWA Regional ITS Architecture Guidance Document*.

**Table 4. Common Agreement Types**

Type of Agreement	Description
Handshake Agreement	<ul style="list-style-type: none"> <li>• Early agreement between one or more partners</li> <li>• Not recommended for long term operations</li> </ul>
Memorandum of Understanding (MOU)	<ul style="list-style-type: none"> <li>• Initial agreement used to provide minimal detail and usually demonstrating a general consensus</li> <li>• Used to expand a more detailed agreement like a Interagency Agreement which may be broad in scope but contains all of the standard contract clauses required by a specific agency</li> <li>• May serve as a means to modify a much broader Master Funding Agreement, allowing the master agreement to cover various ITS projects throughout the region and the MOUs to specify the scope and differences between the projects</li> </ul>
Interagency Agreement (IA)	<ul style="list-style-type: none"> <li>• Between local public agencies (e.g., transit authorities, cities, counties, etc.) for operations, services, or funding</li> <li>• Documents responsibility, functions and liability, at a minimum</li> </ul>
Intergovernmental Agreement (IGA)	<ul style="list-style-type: none"> <li>• Between governmental agencies (e.g., agreements between State DOTs, MPOs, etc.)</li> </ul>
Operational Agreement (OA)	<ul style="list-style-type: none"> <li>• Between any agency involved in funding, operating, maintaining or using the right-of-way of another public or private agency</li> <li>• Identifies respective responsibilities for all activities associated with shared systems being operated and/or maintained</li> </ul>

Type of Agreement	Description
Funding Agreement (FA)	<ul style="list-style-type: none"> <li>Documents the funding arrangements for ITS projects (and other projects)</li> <li>Includes at a minimum standard funding clauses, detailed scope, services to be performed, detailed project budgets, etc.</li> </ul>
Master Agreements (MA)	<ul style="list-style-type: none"> <li>Standard contract and/or legal verbiage for a specific agency and serving as a master agreement by which all business is done and can be found in the legal department of many public agencies</li> <li>Allows states, cities, transit agencies, and other public agencies that do business with the same agencies over and over (e.g., cities and counties) to have one Master Agreement that uses smaller agreements (e.g., MOUs, Scope-of-Work and Budget Modifications, Funding Agreements, Project Agreements, etc.) to modify or expand the boundaries of the larger agreement to include more specific language</li> </ul>

### 6.2.2 Agreement Focus

Rather than focus on a specific technology in an agreement, the focus usually is on the scope-of-service and specific agency responsibilities for various components of the service. The agreement should also describe the high-level information that each agency needs to exchange in order to meet the goals and expectations of the other rather than defining how the delivery of that information will occur.

A simple handshake agreement may be enough for some Wichita-Sedgwick County region activities. However, once interconnections and integration of systems occur, agencies may want to have something more substantial in place in order to document items such as how operations will occur and who will maintain the system. A documented agreement will aid agencies in planning their operational costs, understanding their respective roles and responsibilities, and in building trust for future projects. Formal agreements are necessary where funding or financial arrangements are defined, or where participation in large regionally-significant projects is required.

### 6.2.3 List of Agreements

Several projects may not require agreements because they involve only one stakeholder or do not require the sharing or coordination of data between multiple entities. These projects are outlined in Table 5 below. It should be noted that for some projects with only one primary stakeholder identified, such as the KDOT Ramp Metering Project (Project No. 4A), it is not necessary to have an agreement since there are no other stakeholders affected by the project.

Table 5. Wichita-Sedgwick County Region Projects Not Needing Agreements

<b>Project No.</b>	<b>Project Name</b>	<b>Stakeholder</b>
4A.	KDOT Ramp Metering Project	KDOT
8.	Sedgwick County Maintenance and Construction Vehicle and Equipment Tracking System	Sedgwick County
9.	KDOT Maintenance and Construction Vehicle and Equipment Tracking System	KDOT
10.	City of Wichita Maintenance and Construction Vehicle and Equipment Tracking System	City of Wichita
11.	KDOT Seasonal Maintenance System	KDOT, NOAA
12.	Sedgwick County Seasonal Maintenance System	Sedgwick County, NOAA
13.	City of Wichita Seasonal Maintenance System	City of Wichita, NOAA
16.	Sedgwick County Department of Aging Demand Response Transit System	Sedgwick County
18.	City of Wichita Personalized Para-Transit Services	City of Wichita
25.	Wichita Mid-Continent Airport Emergency Routing Project	Wichita Mid-Continent Airport

Most other projects involve multiple stakeholders and no funding for implementation has been identified. For these projects, it is recommended that a Memorandum of Understanding (MOU) be the first step. Stakeholders becoming a party to the MOU would then pursue further agreements, as needed, for operations, funding, etc. Table 6 includes a summary of projects that are likely to require agreements including of stakeholders, the potential agreement types, and issues that may need to be addressed in the agreements

A sample Memorandum of Understanding (MOU) for the City of Wichita Signal System Upgrade Project (Project 2C) is contained in Exhibit 1. This sample MOU is intended to serve as an example to initiate and/or continue discussion between project Stakeholders in order to assist in moving projects from the architecture level to the project development process.

**Table 6. Wichita-Sedgwick County Region Project Agreement Listing**

No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
1.	City of Wichita Traffic Operations Center	City of Wichita Suburban Communities KDOT Sedgwick County	MOU	Planned	To share in implementation funding and develop strategies for operations and maintenance of the system.	
2A.	City of Wichita ITS Signal System Upgrade Project Study	City of Wichita Sedgwick County	FA	Existing	To share in study funding and develop agreed upon scope and management process for study phase.	
2B.	City of Wichita Signal System Upgrade Project Design	City of Wichita Sedgwick County	MOU	Planned	To share in project design funding and develop agreed upon scope and management process for design phase.	
2C.	City of Wichita Signal System Upgrade Project Implementation	City of Wichita Sedgwick County	MOU OA	Planned	To share in implementation funding and develop strategies for operations and maintenance of system.	
2D.	City of Wichita Signal System Upgrade Project for Sedgwick County	City of Wichita Sedgwick County	MOU OA	Planned	To share in implementation funding and develop strategies for operations and maintenance of system.	
3.	Regional Traffic and Incident Management	KHP KTA KHP-Turnpike Media Sedgwick County Wichita IT/IS City of Wichita Wichita Transit	MOU OA	Planned	To develop roles, responsibilities, and strategy for sharing of traffic data and control among participating regional traffic agencies.	<ol style="list-style-type: none"> <li>1. Access to monitoring devices and data</li> <li>2. Use of KDOT TOC assets</li> <li>3. Use of City of Wichita TOC assets</li> <li>4. Communication links</li> </ol>

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No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
4B	KDOT Traffic Operations Center (TOC) Wichita Metro – Design	KDOT KHP KTA Sedgwick County City of Wichita	MOU OA	Planned	To share in project design funding and develop agreed upon scope and management processes for design phase.	
4C.	KDOT Traffic Operations Center (TOC) Wichita Metro – Near Term	KDOT KHP KTA Sedgwick County City of Wichita	MOU OA	Planned	To develop roles, responsibilities, and strategy for the operation of TOC including services provided and sharing of information and control with participating agencies.	
4D.	KDOT Traffic Operations Center (TOC) Wichita Metro – Medium Term	KDOT KHP KTA Sedgwick County City of Wichita	MOU OA	Planned	Extend agreement to revisit roles, responsibilities, and strategy for the operation of TOC including services provided and sharing of information and control with participating agencies for the medium term.	
4E.	KDOT Traffic Operations Center (TOC) Wichita Metro – Long Term	KDOT KHP KTA Sedgwick County City of Wichita	MOU OA	Planned	Extend agreement to revisit roles, responsibilities, and strategy for the operation of TOC including services provided and sharing of information and control with participating agencies for the long term.	

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No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
5A.	Wichita Area WiMax Communications Site Survey and Design Project	KDOT City of Wichita Sedgwick County Wichita Transit Public Safety Agencies	MOU	Preliminary	To develop survey and design strategy in support of wireless communications needs for KDOT, COW, Sedgwick County, Wichita Transit and Public Safety Agency activities.	<ol style="list-style-type: none"> <li>1. Coverage Areas</li> <li>2. Costs</li> <li>3. Priority of Communications</li> </ol>
5B	Wichita Area WiMax Public Safety Vehicle Communications Project	KDOT City of Wichita Sedgwick County Public Safety Agencies	MOU OA	Planned	To develop roles and responsibilities for WiMax infrastructure to support public safety vehicle wireless communications needs.	
5C	Wichita Area WiMax Transit Vehicle Communications Project	KDOT City of Wichita Sedgwick County Wichita Transit	MOU OA	Planned	To develop roles and responsibilities for WiMax infrastructure to support transit vehicle wireless communications needs.	
6.	Air Quality Alert System	City of Wichita Dept. of Env. Health Media KDHE – Kansas Department of Health and Environment	MOU	Planned if non-attainment is reached	To develop roles, responsibilities, and strategy for monitoring vehicle emissions, processing data and implementation of transportation demand management programs based on identified standards and compliance regulations.	

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No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
7.	Railroad Grade Crossing System	Sedgwick County City of Wichita Railroads	MOU OA FA	Planned	To address agency and railroad expectations for the Railroad Grade Crossing System and develop strategy for operations and maintenance of system including preliminary functional requirements.	
14.	Sedgwick County Dept. of Aging Transit Vehicle Tracking System	Sedgwick County City of Wichita	MOU	Planned	Describe agency intentions and expectations for cooperative development of vehicle tracking hardware, software, and communications infrastructure.	
15.	City of Wichita Transit Vehicle Tracking System	City of Wichita Sedgwick	MOU	Planned	Describe agency intentions and expectations for cooperative development of vehicle tracking hardware, software, and communications infrastructure.	
17.	City of Wichita Transit Fixed-Route Demand Response Transit System	City of Wichita Sedgwick County Wichita Transit KDOT KTA	MOU OA	Planned	To develop roles, responsibilities, and expectations for implementation of transit fixed-route deviations based on travel conditions on the arterials, freeways and turnpike.	

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No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
19.	Wichita Transit Passenger and Fare Management System	City of Wichita Wichita Transit	MOU	Planned	To develop roles, responsibilities, and expectations for implementation of transit passenger fare management system.	
20.	Wichita Transit Security System	City of Wichita Wichita Transit	MOU	Planned	To develop roles, responsibilities, and strategy for operation and maintenance of a transit security system to warn of and protect against hazardous situations.	
21.	Transit Traveler Information System	KDOT Media City of Wichita	MOU	Planned	To develop roles, responsibilities, and strategy for operation and maintenance of a transit traveler information system.	
22.	Public Safety AVL Project	KDOT Sedgwick County City of Wichita Public Safety Agencies	MOU OA	Planned	To address each stakeholder's decision to participate in the project including agency expectations and roles, sharing of data, and desire to cooperatively implement improved emergency response services including call-taking and dispatch, emergency vehicles equipment, vehicles routing, and communications platform.	

No.	Project Name	Stakeholders	Agreement Type(s)	Agreement Status	Agreement Purpose	Agreement Issues
23.	Suburban Communities AVL Project	Suburban Communities Public Safety Agencies	MOU	Planned	To address each stakeholder's decision to participate in the project including agency expectations and roles, sharing of data, and desire to cooperatively implement improved emergency response services including call-taking and dispatch, emergency vehicles equipment, vehicles routing, and communications platform.	
24.	Sedgwick County 911 Emergency Routing Project	KHP KTA KDOT Sedgwick County City of Wichita	MOU	Planned	To develop roles, responsibilities, and strategy for automatic vehicle location and routing including specific traffic or road information to enhance response.	

## **Exhibit 1. Sample MOU**

Wichita-Sedgwick County Regional ITS Architecture  
CITY OF WICHITA ITS SIGNAL SYSTEM UPGRADE PROJECT

### **SAMPLE MEMORANDUM OF UNDERSTANDING**

#### **Purpose**

The City of Wichita and Sedgwick County currently operate independent traffic signal systems including approximately 400+ traffic signals within the City of Wichita and 35+ traffic signals within Sedgwick County. Many of these traffic signals are currently part of the City’s “Closed Loop” traffic signal system which provides “twisted-pair copper wire” communications between adjacent signals and coordination of traffic signal timing plans during peak traffic periods. Through the existing traffic signal and communications system, some traffic signal monitoring and control capabilities are currently provided at City Hall and/or the City Traffic Maintenance facility. Other traffic signals within the City or the County may operate in an isolated, uncoordinated mode at the present time due to minimal traffic demand and/or geographic limitations to the current traffic signal communications system. The City of Wichita ITS Signal System Upgrade Project is being conducted to enhance arterial traffic management capabilities and may include the following elements:

- Upgraded traffic signal controller technology
- Upgraded central traffic system control hardware and/or software
- Upgraded traffic signal communications technology including both wireline (twisted pair, fiber optic, CATV, etc.) and wireless communications media
- An upgraded or expanded traffic operations center (TOC)
- Incorporation of other intelligent transportation system devices including closed-circuit television cameras for monitoring traffic and roadway conditions; dynamic message signs for providing traveler and/or emergency information; and system sensor technology to collect traffic and roadway information.
- Other advanced traffic management system (ATMS) or advanced traveler information system (ATIS) technologies that may be appropriate for the Wichita-Sedgwick County region based on further study.

The study phase of this project is currently underway. A joint funding agreement between the City of Wichita and Sedgwick County was developed for study phase services. The purpose of this Memorandum of Understanding (MOU) is for the City of Wichita and Sedgwick County to express their continued interest in the City of Wichita Signal System Upgrade Project and to express their intentions to continue to work together to develop user requirements, concepts of operations, and functional requirements for the Signal System Upgrade Project. If the Participating Agencies mutually decide to implement the Signal System Upgrade, this MOU further expresses intentions of each Stakeholder to cooperate and collaborate in identifying and

securing funding, designing, implementing, operating and maintaining an upgraded signal system.

This MOU is *not* a legally binding contract – it constitutes solely a guide to the intentions and policies of the Participating Agencies. The MOU is not intended to imply funding availability or authorization to proceed with any of efforts described within the MOU. The Participating Agencies intend to pursue commitments for funding, payment of funds, modifications of current operation practices, or staff, if necessary, through applicable formal agreements or extensions of existing agreements.

**Participating Agencies**

<b>Agency/Department</b>	<b>Key Contact Person</b>	<b>Contact Person Phone</b>	<b>Contact Person E-Mail</b>
City of Wichita, Public Works Department, Traffic Engineering	Paul Gunzelman	(316) 268-4448	pgunzelman@wichita.gov
Sedgwick County, Public Works Department	Mark Borst	(316) 263-9241	mborst@sedgwick.gov

**Expectations**

1. Each Participating Agency expects to continue to collaborate to explore feasibility for development of the Signal System Upgrade to improve the quality and/or cost-effectiveness of services currently provided by each Participating Agency.
2. If the Signal System Upgrade is recommended and proves to be a way to improve services, the Participating Agencies expect to collaborate and cooperate to further fund, develop, design, implement, operate and maintain the Signal System Upgrade Project.
3. The Participating Agencies expect to continue a current Technical Committee or form a Committee comprised of departmental “champions” and technical support staff. The Committee is expected to be the forum for exploration and development of the Signal System Upgrade concept and for recommending approval and/or decisions needed from Department Directors and Agency decision makers.

## **Roles and Responsibilities**

### **City of Wichita, Public Works Department:**

**Roles:** The City of Wichita Public Works Department currently provides traffic management services for traffic signals on City of Wichita roadways. The City currently operates several systems that support these services, including: interconnected and coordinated traffic signals, traffic monitoring cameras, environmental sensing stations and system traffic detectors. The City currently utilizes minimal traffic operations center functions but may upgrade this center in the future to provide additional traffic management capabilities. Staffing is currently limited to peak period operations and some incident/events.

### **Responsibilities:**

The City of Wichita intends to support development of the Signal System Upgrade Project in the following manner:

1. Proactively participate in Signal System Upgrade Committee meetings, deliberations and recommendations.
2. Engage other departmental policy, operations, and/or support staff as necessary to develop user needs, concept of operations and functional requirements for the Signal System Upgrade.
3. Cooperate in the development of formal agreements, as needed, to further develop and implement the Signal System Upgrade project.
4. Continue to proactively and cooperatively seek and secure funding resources, as necessary, to move the Signal System Upgrade Project from concept to reality.

### **Sedgwick County, Public Works Department:**

**Roles:** The Sedgwick County Public Works Department currently provides traffic management services for traffic signals on Sedgwick County roadways. The County currently operates several systems that support these services, including: interconnected and coordinated traffic signals, environmental sensing stations and system traffic detectors.

### **Responsibilities:**

Sedgwick County intends to support development of the Signal System Upgrade Project in the following manner:

1. Proactively participate in Signal System Upgrade Committee meetings, deliberations and recommendations.
2. Engage other departmental policy, operations, and/or support staff as necessary to develop user needs, concept of operations and functional requirements for the Signal System Upgrade.

3. Cooperate in the development of formal agreements, as needed, to further develop and implement the Signal System Upgrade project.
4. Continue to proactively and cooperatively seek and secure funding resources, as necessary, to move the Signal System Upgrade Project from concept to reality.

**Other Agreements**

It is anticipated that other agreements will be needed to move the Signal System Project from concept to reality. These agreements could include funding agreements, operational agreements, and inter-local agreements.

**Term**

This MOU is in effect as of \_\_\_\_\_ and will terminate on \_\_\_\_\_ unless the term is modified by the respective participating agencies.

The following agencies support the Memorandum of Understanding for the City of Wichita Signal System Upgrade Project:

Signed By:

Agency:

Date:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

## **7 Architecture Maintenance Plan**

### **7.1 Introduction**

An ITS Architecture is a blueprint for the deployment of ITS. Just as blueprints are critical for constructing a building, an ITS architecture, if kept up-to-date, is invaluable for ITS deployment. The Wichita-Sedgwick County ITS Architecture is a living document and must change as plans and priorities change, ITS projects are implemented, and the transportation needs and services of the region evolve. The goal of maintaining the architecture is to keep an up-to-date ITS architecture that is accessible and easily used for planning and deploying ITS in the Wichita-Sedgwick County regional area.

This Architecture Maintenance Plan documents who will maintain the architecture and what the maintenance timetable is. The Plan also defines the configuration management process that will be used to maintain the Wichita-Sedgwick County ITS Architecture.

### **7.2 Architecture Maintenance Decisions**

Just as a diverse group of stakeholders were key to the development of the Wichita-Sedgwick County ITS Architecture, it is imperative that stakeholders stay involved in its on-going maintenance. While a variety of stakeholders must be involved in maintenance, it is important to have a single maintainer to oversee maintenance of the architecture.

#### **7.2.1 Architecture Maintainer**

The Wichita-Sedgwick County Metropolitan Area Planning Department conducts regional planning and has relationships with many of the stakeholders in the study area and as such, is responsible for maintaining the Wichita-Sedgwick County ITS Architecture. A person from the Metropolitan Area Planning Department should be designated to serve as the Architecture Manager. Since multiple stakeholders must be involved in architecture maintenance, an Architecture ITS Technical Committee Review Board (ITCRB) should be established to make decisions about revisions to the architecture. The Architecture Manager will accept Architecture Change Request Forms and present them to the ITCRB. An example of the Change Request Form is shown in Appendix A. The Architecture Manager will track changes using the Change Control Log. An example of the Change Control Log is shown in Appendix B. When the ITCRB decides to revise the Wichita-Sedgwick County ITS Architecture, the Architecture Manager will ensure that the changes to the architecture are made and that the architecture configuration management process is followed.

#### **7.2.2 Architecture Maintenance Timetable**

It is critical that the Wichita-Sedgwick County ITS Architecture is revised periodically to ensure that it continues to accurately represent ITS which exists and is planned for the regional area. The architecture will need periodic revisions and less frequent major updates.

Since the architecture supports the Transportation Improvement Plan, it should be determined if the Wichita-Sedgwick County ITS Architecture should undergo a formal review to see if it needs to be updated one year prior to the Plan update. This will ensure that an up-to-date architecture can be used in development of the Plan.

The Wichita-Sedgwick County ITS Architecture should be updated if plans and priorities have drastically changed or the ITS needs and services have evolved in the region. At the time of an update, it is important for all components of the architecture to be examined. Such an update will require stakeholder meetings to review and revise the architecture. The update should involve including additional stakeholders that were not involved previously.

The architecture update process is a natural result of the architecture being streamlined into the transportation planning process to support development of the Transportation Improvement Plan.

The Wichita-Sedgwick County ITS Architecture was developed with a twenty-year time horizon. This is a rolling horizon so as the architecture is updated, it will be extended further into the future.

Minor revisions, such as changes in the status of an information (architecture) flow between ITS elements, will not have to wait for a major update of the architecture. Minor revisions will be made annually. Changes are requested by stakeholders using the change request process described in the following section.

### **7.2.3 Architecture Maintenance Process**

The architecture configuration management activities defined in this plan are:

- Architecture Configuration Identification
- Architecture Configuration Control
- Architecture Configuration Status Accounting
- Architecture Configuration Management Milestones

#### **7.2.3.1 Architecture Configuration Identification**

The Wichita-Sedgwick County ITS Architecture is defined to include:

- Wichita-Sedgwick County ITS Architecture Executive Summary,
- Wichita-Sedgwick County ITS Architecture Document,
- Wichita-Sedgwick County ITS Architecture Implementation Plan,
- Wichita-Sedgwick County ITS Architecture Maintenance Plan,
- Wichita-Sedgwick County ITS Architecture Communications Plan,
- Wichita-Sedgwick County ITS Architecture Website and
- Wichita-Sedgwick County ITS Architecture Database (a Turbo Architecture and Microsoft Access database).

USDOT’s Final Rule/ Final Policy requires that, at a minimum, an ITS architecture shall include nine components. The Wichita-Sedgwick County ITS Architecture contains:

- Description of the region in the Wichita-Sedgwick County ITS Architecture Document,
- Identification of the participating agencies and stakeholders in the Wichita-Sedgwick County ITS Architecture Document,
- An operational concept that identifies roles and responsibilities of stakeholders in the Wichita-Sedgwick County ITS Architecture,
- Any agreements required for operations in the Wichita-Sedgwick County ITS Architecture Implementation Plan,
- System functional requirements (high level) in the Wichita-Sedgwick County ITS Architecture Document,
- Interface requirements and information exchanges with planned and existing systems and subsystems in the Wichita-Sedgwick County ITS Architecture Document,
- Identification of ITS standards supporting regional and national interoperability in the Wichita-Sedgwick County ITS Architecture Implementation Plan,
- Sequence of projects required for implementation in the Wichita-Sedgwick County ITS Architecture Implementation Plan, and
- Procedures and responsibilities for maintaining the architecture in the Wichita-Sedgwick County ITS Architecture Maintenance Plan.

Some components of the Wichita-Sedgwick County ITS Architecture may require more frequent updates than others, but the entire architecture will need a periodic review for consistency with the vision and goals of the Wichita-Sedgwick regional area stakeholders.

The key components of the architecture are stored in a Microsoft Access database that was created and can be revised with Turbo Architecture™. The initial version of the Wichita-Sedgwick County ITS Architecture was developed using version 3.0 of Turbo Architecture™ so the following information is contained in the database and should be maintained in the Turbo Architecture™ databases:

- Description of the region,
- List of ITS stakeholders,
- Operational concepts,
- Inventory of ITS elements and services,
- Inventory of ITS services and the elements involved in them,
- Functional Requirements of each element,
- Interfaces between elements (interconnects and architecture flows),
- Applicable ITS standards, and
- List of agreements.

The architecture diagrams and reports can be produced directly from Turbo Architecture™. The diagrams and reports are by-products of the architecture database and can be generated when

needed. A companion website that contains the functional requirements and operational concepts is currently found at [www.iteris.com/wichitaarchitecture](http://www.iteris.com/wichitaarchitecture).

For a major update of the architecture, all documents must be updated. It is not critical to revise the documents every time the architecture database is revised. They can be updated as necessary for meetings or outreach activities.

Version 3.0 of Turbo Architecture™ is based on version 5.0 of the National ITS Architecture.

#### *Architecture Specification Identification*

To aid in architecture version control, the filename of the documents and database should contain the version and/or date on which it was updated. This will allow the current version to be easily identified and for all items of the same version to be identified. The initial version of the Wichita-Sedgwick County ITS Architecture developed in April 2005 and adopted by the WAMPO is version 1.0. As minor revisions are made, the release number is incremented (i.e. 1.1, 1.2, 1.3, ...) The version number is incremented when the architecture undergoes a major update (i.e. 2.0, 3.0, 4.0, ...)

All items of the initial version of the architecture are labeled V1.0 (04-04-05).

#### *Change Control Form Identification*

Revisions to the Wichita-Sedgwick County ITS Architecture can be submitted to the Architecture Manager on the Architecture Change Request Form. Version 1.0 of the form and instruction for using it are given in Appendix A of this Plan. A copy of the form to be posted on the website was created with Adobe Acrobat version 5.0. The form can be read but not modified using the free Adobe Acrobat Reader. Using the naming convention, the file is named “Wichita-Sedgwick County ITS Architecture Change Request Form V1.0 (02-28-05).

Revisions to the Wichita-Sedgwick County ITS Architecture will be tracked on the Architecture Change Request Form by the Architecture Manager. The format of the log is given in Appendix B. To allow easy entry, the form will be maintained in Microsoft Excel. Using the naming convention, the file is named “Wichita-Sedgwick County ITS Architecture Change Control Log V1.0 (02-28-05).

#### *Architecture Baselines*

The initial version of the Wichita-Sedgwick County ITS Architecture completed in March 2005 is established as the baseline architecture. It is numbered version 1.0. The baseline contains:

- Wichita-Sedgwick County ITS Architecture Executive Summary,
- Wichita-Sedgwick County ITS Architecture Document,
- Wichita-Sedgwick County ITS Architecture Implementation Plan,

- Wichita-Sedgwick County ITS Architecture Maintenance Plan,
- Wichita-Sedgwick County ITS Architecture Communications Plan,
- Wichita-Sedgwick County Regional ITS Architecture website and the
- Wichita-Sedgwick County ITS Architecture Database (a Turbo and Microsoft Access database).

The maintenance time frames identified in this Maintenance Plan began upon its completion.

Only the Architecture Maintainer can set a baseline. A new baseline must be documented in the architecture database and all documents.

### **7.2.3.2 Architecture Configuration Control**

A change management process is the procedure that will be used for modifying the architecture. It identifies how changes are identified, how they are requested, how they are reviewed and implemented and how the changes will be released. The change management process for the Wichita-Sedgwick County ITS Architecture is specified in the following sections.

#### *Change Identification Procedures*

The Wichita-Sedgwick County ITS Architecture was created as a consensus view of what ITS systems have been or are planned to be implemented in the future. The architecture will need to be revised to reflect changes to ensure that it reflects the current conditions and desires of the region. There are many actions that may cause a need to revise the architecture.

- *Changes for Project Definition.* When defined, a project may add, subtract or modify elements, interfaces, or information flows of the ITS architecture. Because the architecture is meant to describe not only ITS planned for the region, but also the current ITS implementations, it should be updated to correctly reflect the deployed projects.
- *Changes for Project Addition/Deletion.* Occasionally a project will be added, deleted or modified during the planning process. When this occurs, the aspects of the ITS architecture associated with the project have to be added, deleted or modified.
- *Changes in Project Status.* As projects are deployed, the status of the architecture elements, services and flows that are part of the project will have to be changed from planned to funded/programmed to existing. Elements, services and flows will be considered to exist when they are substantially complete in that they are currently operating.
- *Changes in Project Priority.* Due to funding constraints, technological changes or other considerations, a project planned may be delayed or accelerated. Such changes will need to be reflected in the Wichita-Sedgwick County ITS Architecture.
- *Changes in Needs.* Over time the needs in the region will change and the corresponding aspects of the Wichita-Sedgwick County ITS Architecture will have to be updated.

While the Wichita-Sedgwick County ITS Architecture was developed with input from several stakeholders, not all stakeholders could participate. As ITS deployment increases and benefits of integration are realized, additional stakeholders will become interested in ITS, the architecture should be updated to reflect their place in the vision for ITS. The systems they operate and their interfaces may have to be added or revised.

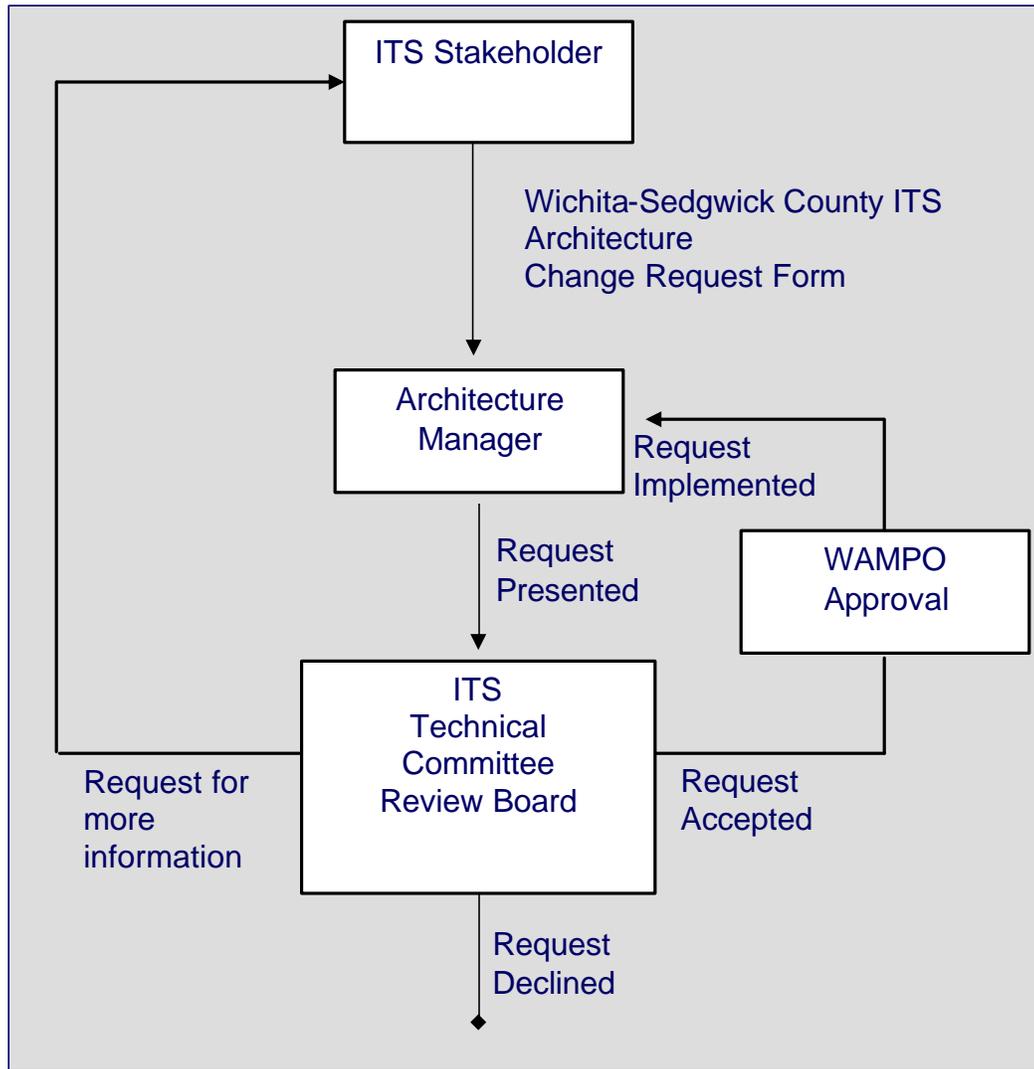
- *Change to the National ITS Architecture.* Just as with any ITS architecture, the National ITS Architecture is a living resource; it is expanded and updated from time to time. The initial version of the Wichita-Sedgwick County ITS Architecture was based on version 5.0 of the National ITS Architecture that was released in early 2004 and is the current version. When a new version of the National ITS Architecture is released, during the next update of the Wichita-Sedgwick County ITS Architecture, the new services of the National ITS Architecture should be considered to see if they are applicable to the Wichita-Sedgwick regional area.

#### *Change Request Processing Procedures*

Any stakeholder in The Wichita-Sedgwick regional area can propose a change to the Wichita-Sedgwick County ITS Architecture. Stakeholders should inform the Architecture Manager of a change in the status of any ITS-related project. To properly maintain the architecture, the Architecture Manager must be informed not only when projects are planned; but also when projects are completed or when changes are made during design or construction that impacts the architecture.

Change requests must be submitted on the Wichita-Sedgwick County ITS Architecture Change Request Form. The form must be submitted to an Architecture Manager. The Change Request Forms should clearly define how the architecture needs to be revised. The reasons for the proposed revisions should be given. Each proposal should include contact information for the individual proposing the change so he or she can be contacted if questions arise.

The process for reviewing requested changes and implementing them is shown in Figure 3. This process has been reviewed and accepted by the ITS steering committee responsible for oversight of this architecture and led by the MAPD. At an Architecture ITS Technical Committee Review Board (ITCRB) meeting, the Architecture Manager will present all proposed architecture revisions to the ITCRB for their review and consideration. If a proposal for an architecture revision impacts other stakeholders, the Architecture Manager will ensure that the impacted stakeholders have been contacted and their agreement with the modification is confirmed. If any issue involves several stakeholders or requires extensive discussion and agreement, a stakeholder meeting to discuss the modification may be held. If consensus in favor of the modification is reached, the Architecture Manager will recommend the revision to the ITCRB.



**Figure 3. Architecture Change Process**

When the ITCRB approves modifications to the Wichita-Sedgwick County ITS Architecture, the Architecture Manager will ensure that the architecture is modified to reflect the approved modifications and is posted on the website. Note that upon concurrence from the ITCRB, the architecture modification must receive approval from the WAMPO Board prior to the Wichita-Sedgwick County ITS Architecture being updated by the Architecture Manager.

### *ITS Technical Committee Review Board (ITCRB)*

Getting input from the stakeholders guarantees that the architecture continues to reflect the desires of the stakeholders; therefore, the ITS Technical Committee Review Board (ITCRB) must be made up of a wide array of stakeholders. The ITCRB will be chaired by the Architecture Manager. While a change will not always impact the entire region, it is advantageous for representatives throughout the region to have input to architecture changes.

The ITCRB chairperson will call a meeting when change requests warrant it or when the architecture is being updated. A meeting is warranted when there are over 20 change requests or there is a change request that is urgent since the project is ready for deployment.

At an ITCRB meeting, the Architecture Manager will present all change requests. The committee will discuss. If the stakeholders impacted by the change are not present and have not submitted their comment on a change, the change should be tabled for a future meeting when their input can be gathered. The ITCRB will vote on whether each change request should be accepted or rejected.

### *Change Control Responsibilities*

The Wichita-Sedgwick County ITS Architecture Change Process involves three parties which have distinct responsibilities as listed below.

#### ITS Stakeholder:

- Propose revisions to the architecture when appropriate.
- Participate in ITCRB meetings when appropriate.

#### Architecture Manager:

- Serve as chairperson of the ITCRB.
- Schedule ITCRB meetings when required.
- Investigate all change requests.
- Contact stakeholders impacted by a change request and invite them to the ITCRB meeting or get their input.
- Present change requests to the ITCRB.
- Track all change requests and changes to the architecture.
- Ensure that the architecture is revised for all approved change requests.
- Plan and execute configuration audits prior to releasing a baseline.
- Post the architecture on the website.
- Send an announcement of an architecture revision to all stakeholders.

#### ITCRB Members:

- Attend meeting when Architecture Manager schedules a meeting.
- Review proposed architecture revisions prior to meeting.
- Vote on proposed architecture revisions at meeting.

WAMPO Board:

- Approval of the proposed architecture revision, following concurrence on the revision from the ITCRB, and prior to the physical architecture update by the Architecture Manager.

#### 7.2.4 Architecture Configuration Status Accounting

Configuration status accounting is the process of ensuring that all of the relevant information about an item – documentation and change history – is up-to-date and as detailed as necessary. This includes the status of proposed changes. Configuration status accounting also include the dissemination of configuration information. Configuration Status Accounting for the Wichita-Sedgwick County ITS Architecture is detailed in the following sections.

##### 7.2.4.3 Architecture Media

To allow stakeholders to use the architecture for their planning and deployment activities, the current Wichita-Sedgwick County ITS Architecture must be readily available. The Wichita-Sedgwick County ITS Architecture is available to all stakeholders on the project website [www.iteris.com/wichitaarchitecture](http://www.iteris.com/wichitaarchitecture).

Once the Wichita-Sedgwick County ITS Architecture (or any part of it) has been revised or updated, the appropriate stakeholders will be notified. The Architecture Manager will maintain the list of ITS stakeholders and their contact information. The stakeholders will be notified via e-mail of the architecture revisions as soon as the current version of the architecture is available on the website.

##### 7.2.4.4 Document Status Accounting

The Architecture Maintainer will track all proposed and approved changes to the Wichita-Sedgwick County ITS Architecture using the Wichita-Sedgwick County ITS Architecture Change Control Log. The format of the log and instructions for using it are given in Appendix B.

The status of all proposed changes will be posted on the architecture page on the project website. This will allow stakeholders to know exactly what has changed when the architecture is revised.

To ensure that stakeholders know the current architecture configuration, the current version of all components will be listed on the architecture page on the project website. The current configuration is:

**Table 7. Wichita-Sedgwick County Regional ITS Architecture components and files**

Architecture Component	File
Wichita-Sedgwick County ITS Architecture Executive Summary	Wichita-Sedgwick County ITS Architecture Executive Summary

Wichita-Sedgwick County ITS Architecture Document	Wichita-Sedgwick County ITS Architecture Document (Volume 1)
Wichita-Sedgwick County ITS Architecture Implementation Plan	Wichita-Sedgwick County ITS Architecture Implementation (Volume 2)
Wichita-Sedgwick County ITS Architecture Maintenance Plan	Wichita-Sedgwick County ITS Architecture Maintenance Plan (Volume 2)
Wichita-Sedgwick County ITS Architecture Communications Plan	Wichita-Sedgwick County ITS Architecture Communications Plan (Volume 3)
Wichita-Sedgwick County ITS Architecture Website	Various
Wichita-Sedgwick County ITS Architecture Database	Wichita-Sedgwick County ITS Architecture V1.0 (date).tbo

**7.2.5 Architecture Configuration Auditing**

Configuration auditing is the process of analyzing configuration items and their respective documentation to ensure that the documentation reflects the current situation. A configuration audit should be performed when a baseline is set. The audit does not have to be performed by the Architecture Maintainer but he or she should ensure that one is performed.

In the case of the Wichita-Sedgwick County ITS Architecture, the architecture database is used to create the documentation so to ensure that the documents contain the information in the current database, they should be created after the database is finalized. Once the configuration audit is complete, the architecture baseline can be released.

## **A Appendix: Wichita-Sedgwick County ITS Architecture Change Request Form**

### Instructions for Using the Change Request Form

The stakeholder requesting the change will complete the top portion of the form. Once the form is received,

1. Assign it a unique Change Request Number. Change Request Numbers should be assigned with Year and Month of request and the sequential number of the request in the format YYMNNO. For example the second request received in March of 2006 is Change Request 060302.
2. Identify additional stakeholders that would be impacted by the change. It is critical to have input from the impacted stakeholders on the requested change.
3. Once the ITCRB has acted on the request, record their action (accepted, rejected or deferred a date.)
4. Record the date of the disposition of the request.
5. Record any special comments about the disposition. For example, the change request may have been approved for the next major update of the architecture.

# Wichita-Sedgwick County ITS Architecture

## Change Request Form

CHANGE TITLE:	
Origination Date:	
Description of Change:	
Need/Reason for Change:	
Originator:	
Phone #:	
e-mail:	
To be completed by Architecture Maintainer:	
Change Request #:	
Stakeholder Impacted:	
Change Disposition:	<input type="checkbox"/> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/> Deferred until
Disposition Date:	
Disposition Comment:	

## B Appendix: Wichita-Sedgwick County ITS Architecture Change Control Log

Instructions for Completing the Change Control Log:

Enter all change requests on the Change Control Log. For each request enter:

Change Request #:	Number assigned on the Change Request Form
Date Submitted:	Date the Change Request for was received
ITCRB Action:	Three Options:
	1. Awaiting action of the Board
	2. Change was approved so enter date of approval
Status:	3. Change was rejected so enter date of rejection
	Four Options:
	1. Change is on-hold for the next major update
	2. Impact of change is under investigation
	3. Change description has been entered on a Change Control Log Change Description form
	4. Change is being made so it is in-progress
	Once the change is started, record the target date for completion
	Once the change is complete, record the completion date

For each approved Change Request, record the details of the change on a Change Control Log – Change Description form. On the form include:

Change Request #:	Number assigned on the Change Request Form
Change Request Description:	Brief description of the Proposed Change (Either the description from the Change Request Form or a summary of it)
Impact(s) of Change:	For each architecture component impacted by the change, record the impact of the change on the component
	If an architecture component is not impacted by the change, enter “n/a”.
Resolution(s) of Change:	For each architecture component impacted by the change, record how the component will be modified for the change
	If an architecture component is not impacted by the change, enter “n/a”.



CHANGE REQUEST #:	CHANGE REQUEST DESCRIPTION:	
Architecture Component	Impact(s) of Change	Resolution(s)
Wichita-Sedgwick County ITS Architecture Executive Summary		
Wichita-Sedgwick County ITS Architecture Document		
Wichita-Sedgwick County ITS Architecture Implementation Plan		
Wichita-Sedgwick County ITS Architecture Communications Plan		
Wichita-Sedgwick County ITS Architecture Maintenance Plan		
Wichita-Sedgwick County ITS Architecture Website		
Wichita-Sedgwick County ITS Architecture Database		

## C Appendix: Wichita-Sedgwick County ITS Architecture Implementation and Communication Plan Stakeholder Meetings

### Architecture Stakeholder Meeting 2 (March 8-9, 2005)

	First Name	Last Name	Agency	Title	Division
1	Bob	Alva	FHWA	ITS/Safety Engineer	Kansas Division
2	Mitch	Blackburn	City of Wichita	Application Support Manager	IT
3	Barb	Blue	KDOT	ATIS Coordinator	KS Bureau of Transportation Information
4	Mark	Borst	Sedgwick County	Engineer	Public Works
5	Jeff	Brummond	Iteris	Principal Systems Architect	
6	Dale	Coffman	Park City Police Department	Captain	
7	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
8	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
9	Paul	Gunzelman	City of Wichita	City Traffic Engineer	Public Works
10	Tom	Hein	KDOT	Public Affairs Manager	Division of Operations
11	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
12	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
13	Mike	Malone	Iteris	Associate Vice President	
14	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
15	Bill	McKinley	City of Maize	Consultant	
16	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
17	Chuck	Miller	HNTB	Engineer	
18	Paul	Moser	City of Wichita	Captain	
19	Terry	Nicholas	City of Wichita	Signal Supervisor	Traffic
20	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
21	Lew	Phillips	RCC Consultants	Sr. Consultant	

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22	Talbert	Showalter	City of Wichita	Planning Analyst	Wichita Transit
23	Doug	Siesel	Iteris	Sr.Systems Engineer	
24	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)
25	Ted	Trask	Wichita Fire	Battalion Chief #9	Fire Department
26	Michael	Weins	RCC Consultants	Director	

**Architecture Stakeholder Meeting (March 10, 2005)**

	<b>First Name</b>	<b>Last Name</b>	<b>Agency</b>	<b>Title</b>	<b>Division</b>
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	James	Armour	City of Wichita	Acting City Engineer	Engineering
3	Mitch	Blackburn	City of Wichita	Application Support Manager	IT
4	J. Michael	Bowen	FHWA	Division Administrator	Office of the Division Administrator
5	Jeff	Brummond	Iteris	Principal Systems Architect	
6	Andrew	Busada			
7	Chris	Carrier	City of Wichita	Director	Public Works
8	I. D	Creech	City of Valley Center	City Manager	
9	Jeet	Desai	MAPD	Associate Planner	Transportation
10	Morris K.	Dunlap	Sedgwick County	Metropolitan Area Planning Commission	Metropolitan Planning Organization
11	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
12	Diane	Gage	Sedgwick County	Director	Emergency Communication
13	Larry	Garcia	Wichita Fire Department	Fire Chief	Fire Department
14	John	Gaunt	KS Hwy Patrol Communications	Major	Dispatch
15	Karen	Gilbertson	KDOT	ITS Engineer	KS Bureau of Transportation Planning
16	Nancy	Harvieux	MAPD	Principal Planner	Transportation
17	Kent	Hixhon	City of Mulvane	City Administrator	
18	Cathy	Holdeman	City of Wichita	Assistant City Manager	City Managers' Office
19	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
20	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
21	Robert	Lamkey	Sedgwick County	Director	Public Safety
22	Byron	Low	FHWA	Team Leader	
23	Mike	MackKay	McConnell AFB	Environmental Engineer	

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24	Mike	Malone	Iteris	Associate Vice President	
25	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
26	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
27	Wendall	Meyer	FHWA	FHWA Assistant Division Administrator	Administration
28	M. S.	Mitchell	City of Wichita	Metropolitan Area Planning Commission	Metropolitan Planning Organization
29	Paul	Moser	City of Wichita	Lt.	
30	Marjie	Norton	KDOT	Associate Planner	KS Bureau of Transportation Planning
31	Michael	Oliver	Sedgwick County	Lieutenant	Sedgwick County
32	Karyn	Page	Kansas World Trade Center	Executive Director	Board of Directors
33	Joe	Pajor	City of Wichita	Director of Natural Resources	Public Works Natural Resources
34	Talbert	Showalter	City of Wichita	Planning Analyst	Wichita Transit
35	Kirk	Swilley	City of Wichita	CIO	IT/IS
36	Alan	Tigard	City of Wichita	Traffic Maint.	
37	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department
38	Richard	Vogt	Sedgwick County	Chief Technology Officer	Information & Operations

**Architecture Stakeholders Public Meeting (March 10, 2005)**

	<b>First Name</b>	<b>Last Name</b>	<b>Agency</b>	<b>Title</b>	<b>Division</b>
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	Jeff	Brummond	Iteris	Principal Systems Architect	
3	Jeet	Desai	MAPD	Associate Planner	Transportation
4	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
5	Teresa	Freed	KAKE- TV	Reporter	
6	Mike	Malone	Iteris	Associate Vice President	
7	Fred	Mann	Wichita Eagle		
8	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
9	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
10	Larry	Ross	Greenway Alliance		

**Architecture Stakeholders Meeting 2A (April 26, 2005)**

	<b>First Name</b>	<b>Last Name</b>	<b>Agency</b>	<b>Title</b>	<b>Division</b>
1	Purab	Adabala	MAPD	Planning Analyst	Transportation
2	Mitch	Blackburn	City of Wichita	Application Support Manager	IT
3	Mark	Borst	Sedgwick County	Engineer	Public Works
4	Jeff	Brummond	Iteris	Principal Systems Architect	
5	Jeet	Desai	MAPD	Associate Planner	Transportation
6	Mike	Floberg	KDOT	State ITS Engineer	KS Bureau of Transportation Planning
7	Tom	Hein	KDOT	Public Affairs Manager	Division of Operations
8	Julianne	Kallman	City of Wichita	Associate City Manager	Public Works
9	Kent	Koehler	Sedgwick County	Senior Project Manager	Information & Operations-IT Development
10	Mike	Malone	Iteris	Associate Vice President	
11	Dennis	McHugh	City of Wichita	Transit Analyst	IT/IS
12	Jamsheed	Mehta	MAPD	Chief Planner	Transportation
13	Lew	Phillips	RCC Consultants	Sr. Consultant	
14	Doug	Siesel	Iteris	Sr. Systems Engineer	
15	Alan	Stoecklein	KHP	Commander	Troop F
16	Benny	Tarverdi	KDOT	Metro Engineer, KDOT District 5	Road Condition Reporting System (RCRS)
17	Ted	Trask	Wichita Fire Department	Battalion Chief #9	Fire Department
18	Michael	Weins	RCC Consultants	Director	